1

00:06:12.390 --> 00:06:26.910

Live Meeting: And in that endeavor I will say that do not doubt you were carefully selected through a complex process where we tried to get representation from a variety of expertise.

2

00:06:27.990 --> 00:06:35.310

Live Meeting: which I think we've succeeded at we have expertise across non-proliferation fusion fusion we've got it academia, we have.

3

00:06:35.730 --> 00:06:46.440

Live Meeting: representation with perspectives from different cultures and academic fields and national laboratories and industry, and I think.

4

00:06:46.980 --> 00:06:56.820

Live Meeting: We have achieved a little bit more representation and makes us look slightly more like America, which is a high priority for this White House and this administration.

5

00:06:57.810 --> 00:07:06.090

Live Meeting: This slate of individuals was reviewed, of course, all the way up through the White House and you have the confidence in myself Secretary.

6

00:07:06.510 --> 00:07:15.240

Live Meeting: And the President to advise the office of nuclear energy in this endeavor so i'm grateful to you i'm especially grateful today for Maria.

7

00:07:15.510 --> 00:07:32.340

Live Meeting: Stepping in to the Chair role, I cannot think of anyone more capable of stepping into build shoes in this endeavor with no notice whatsoever and so thank you so very much and with that, I would like to turn it over to our acting chair marine corps Nick.

8

00:07:46.860 --> 00:07:48.000

Live Meeting: Thank you very much.

9

00:07:49.020 --> 00:07:53.880

Live Meeting: i'm often mistaken for bill mag what because oh yeah we look so very similar.

10

00:07:55.230 --> 00:08:17.580

Live Meeting: i'm actually very happy to to step into his very large shoes and actually I hope he is feeling much better very soon and and we'll be back to join us, but anyway very, very excited quite frankly about our endeavor as a team here for the nuclear energy advisory committee.

11

00:08:18.690 --> 00:08:27.360

Live Meeting: Maybe just let me start with with a little bit of background to say this is such a precious time for nuclear energy.

12

00:08:28.200 --> 00:08:40.350

Live Meeting: I personally have been in the nuclear energy field for about 36 years and it's unlike any time in that 36 years okay that i've that i've been in and.

13

00:08:40.650 --> 00:08:46.170

Live Meeting: And when you say, well, Maria you know what are you thinking about how are you imagining this you know what, what are the forces that you're seeing.

14

00:08:46.590 --> 00:08:55.650

Live Meeting: You know, really it's it's across the board it's at the federal level, both from a legislative perspective as well as an appropriations perspective.

15

00:08:55.920 --> 00:09:07.080

Live Meeting: it's at the State level, you know if if even five years ago, I would have told you that we had a handful of bills in state legislators that had anything to do with nuclear energy.

16

00:09:07.320 --> 00:09:23.160

Live Meeting: That would be amazing today we have over 100 bills okay going through State legislators that have to do with nuclear energy Okay, I mean that's just one data point, but I want you to feel the inflection point that we are at right now for nuclear energy.

17

00:09:23.580 --> 00:09:31.980

Live Meeting: And it's, not just in the United States right it's here it's internationally i've been doing quite a bit of travel, some of my travel has has intersected.

18

00:09:32.430 --> 00:09:44.430

Live Meeting: The Secretary and the assistant secretaries schedules, and so I don't know just read some of the headlines, the United Kingdom, France, Romania, the Czech Republic.

19

00:09:45.810 --> 00:09:56.250

Live Meeting: I just came back from Japan Japan is working to start up their current fleet and also beginning to consider what about nuclear beyond their current fleet.

20

00:09:57.270 --> 00:10:06.150

Live Meeting: have been having conversations with folks in Ghana that are interested, so in Canada, I probably forgot to even mention our closest neighbor.

21

00:10:06.510 --> 00:10:14.280

Live Meeting: And so you know again it's not just a conversation here in the United States and its private investment it's r&d.

22

00:10:15.090 --> 00:10:24.270

Live Meeting: And so you know really just across the board, and then you would say to yourself well why even is that you know, like why all of a sudden what's this thing about nuclear.

23

00:10:24.990 --> 00:10:28.620

Live Meeting: And so step back for a minute, you know there's there's a variety of factors.

24

00:10:29.400 --> 00:10:45.270

Live Meeting: Sure there's a lot of attention on the climate Okay, so that brings up carbon and carbon free as a conversation people are interested in emissions free people are interested in really reliable electricity people want resilience electricity I want electricity.

25

00:10:46.620 --> 00:10:51.690

Live Meeting: They want to know that it's going to be there, they want to make sure that it's going to be there, whenever it is that they need it.

26

00:10:53.490 --> 00:11:05.130

Live Meeting: it's energy security, right now, unfortunately we're in a world today where we're looking across the globe and understanding, some people have a real focus on energy security, because where they were getting their energy.

27

00:11:05.310 --> 00:11:15.900

Live Meeting: Someone is deciding whether or not they want that pipeline to even be full anymore and they're very dependent on a force that they would like to not have anything to do with okay.

28

00:11:16.200 --> 00:11:26.280

Live Meeting: And so that brought energy security to the fore well you know, energy is such a big part of the economy, when you start talking, energy security, you quickly get to national security.

29

00:11:26.670 --> 00:11:38.490

Live Meeting: And then of course we step back and say well we're going to make this transition to carbon free and to clean, we want it to be a just transition that's very important so jobs are very important.

30

00:11:38.910 --> 00:11:47.310

Live Meeting: And when you look at that whole list that I just mentioned, nuclear energy answers every single one.

31

00:11:48.090 --> 00:12:00.270

Live Meeting: And that's why there's a conversation about nuclear energy today it's not just one of those it's all of those Okay, and so unprecedented interest.

32

00:12:00.900 --> 00:12:08.880

Live Meeting: Every year, I say this is the most interest that its head and then the next year it's even more Okay, and I would tell you that has continued.

33

00:12:09.180 --> 00:12:13.980

Live Meeting: Over the last I don't know three to four years, like we're at this almost exponential.

34

00:12:14.370 --> 00:12:23.610

Live Meeting: interest and attention in nuclear, so to say that we, as the nuclear Advisory Committee have an important job to do, I cannot overstate.

35

00:12:23.940 --> 00:12:31.380

Live Meeting: That all of the different perspectives that you bring from all the different seats that you have and from the experience that you bring.

36

00:12:31.740 --> 00:12:38.940

Live Meeting: To be able to advise this very important department, right now, at this time.

37

00:12:39.600 --> 00:12:52.260

Live Meeting: is precious absolutely precious and we should take that on as an advisory committee that it's always an important committee it's always important to provide this information, but now.

38

00:12:52.950 --> 00:13:04.740

Live Meeting: Now, a special and we should wear that very carefully as we decide what we want to focus on decide what we need to have as a priority and decide to move forward.

39

00:13:05.430 --> 00:13:12.570

Live Meeting: Just because there's a lot of interest in intention doesn't mean it's going to be easy so yeah it would be nice if.

40

00:13:13.200 --> 00:13:22.200

Live Meeting: They came together, but not necessarily right there's regulatory efficiency issues they're citing efficiency issues there's supply chain issues.

41

00:13:22.800 --> 00:13:34.080

Live Meeting: Fuel as part of that supply chain issue, and so you know there's there's many workforce, how do we get a workforce ready for what we imagine.

42

00:13:34.530 --> 00:13:46.080

Live Meeting: We already talked about international and then of course spent fuel whenever you talk about nuclear there's always a conversation about in, then what to do next once you've used that fuel.

43

00:13:47.010 --> 00:14:01.110

Live Meeting: Oh just once I look at that, as a future resource and so again, those are those are conversations we can have when I talked about the fact that there's all this interest, I guess, let me just also give you a view when we talk about.

44

00:14:02.190 --> 00:14:06.330

Live Meeting: Maybe what's the potential what's the potential for nuclear and.

45

00:14:06.810 --> 00:14:18.600

Live Meeting: And so, in the job that I sit in i'm connected to the nuclear industry we pull together the chief nuclear officers on a regular basis, and so we pulled the chief nuclear officers and we said listen.

46

00:14:19.140 --> 00:14:23.910

Live Meeting: Some of the companies are coming out and they're integrated resource plans and they're talking about nuclear.

47

00:14:24.180 --> 00:14:28.500

Live Meeting: Some of them are holding back just a bit because they want to talk within their company first.

48

00:14:28.800 --> 00:14:39.990

Live Meeting: let's do a poll and i'm not going to attribute it to any company, but just tell us what you're thinking about just tell us what your company is thinking about let's say, between now and 2050.

49

00:14:40.470 --> 00:14:48.030

Live Meeting: Okay, so all the chief nuclear officers and these represent the companies that own nuclear power plants today and.

50

00:14:48.600 --> 00:14:56.430

Live Meeting: The feedback that they provided was between now and 2050 they're interested in about 90 gigawatts of electricity.

51

00:14:56.940 --> 00:15:01.200

Live Meeting: Okay, we have about 90 gigawatts of electricity from nuclear today.

52

00:15:01.770 --> 00:15:11.160

Live Meeting: So when the chief nuclear officer say as behind closed doors, if you will we're thinking about nuclear as we look forward it's about doubling.

53

00:15:11.430 --> 00:15:20.700

Live Meeting: The amount of electricity today that we get from nuclear now these chief nuclear officers represent about 40% of the electric system.

54

00:15:20.940 --> 00:15:29.010

Live Meeting: So now, you can imagine all right, that was really a sampling, but it was a sampling really of only 40% of the market, and so, then, if you correct it up.

55

00:15:29.490 --> 00:15:36.120

Live Meeting: For that, and then you say well you know what today we're just talking electricity, but is that all that we're going to get from nuclear energy.

56

00:15:36.480 --> 00:15:45.990

Live Meeting: Well, of course, not right we're going to get high temperature steam from some people that just want the high temperature steam to help them decarbonize what they're doing like in the manufacturing sector.

57

00:15:46.350 --> 00:15:49.200

Live Meeting: And what about hydrogen right easy to use.

58

00:15:49.890 --> 00:15:58.110

Live Meeting: What we can from a nuclear plant to make hydrogen, so now we really need to think about nuclear is just an energy source, not just a producer for electricity.

59

00:15:58.350 --> 00:16:09.480

Live Meeting: So let's go back to that CFO study if we were going to do all of that, with small modular reactors and get those 90 gigawatts you're talking 300 small modular reactors and again an under sampling of.

60

00:16:10.200 --> 00:16:19.860

Live Meeting: The system, if you will, because that's really only representing 40% of the market and only representing electricity in that market right and we just talked about nuclear can do much more than that.

61

00:16:20.130 --> 00:16:28.410

Live Meeting: So we also commissioned a study it was by vibrant clean energy and we said, what would the market do if you just let the market do what it wanted and they did.

62

00:16:28.650 --> 00:16:34.650

Live Meeting: A market study and they also did a constraint, study and i'll just kind of cut to the chase but in the in the.

63

00:16:35.070 --> 00:16:43.830

Live Meeting: What would the market get if the market could just choose as much nuclear as it could between now and 2050 instead of.

64

00:16:44.820 --> 00:16:57.060

Live Meeting: 300 reactors, the model would pick about 1000 and and then, if you constrained that and said well there's some difficulty, whatever that difficulty might be could be supply chain could be.

65

00:16:57.540 --> 00:17:10.470

Live Meeting: Some other issue instead you're in the neighborhood of 350 or or 400 so my point to you and saying this isn't that any of the numbers that I just shared with you are correct or accurate.

66

00:17:10.770 --> 00:17:16.410

Live Meeting: it's really more to look at the trend right, and so, whether or not we're pulling folks that.

67

00:17:16.620 --> 00:17:30.060

Live Meeting: are involved with nuclear today, and you get a number around 300 or, if you do a model and you get a number somewhere north of three or 400 The point is that the market demand.

68

00:17:30.360 --> 00:17:36.420

Live Meeting: For reliable scalable nuclear power is absolutely there.

69

00:17:36.840 --> 00:17:48.180

Live Meeting: So really our challenge is understanding that how, in fact, do we prepare in regulatory space and supply chain, space and work for space.

70

00:17:48.360 --> 00:17:58.140

Live Meeting: How do we prepare for this, so that the market is able to choose this highly reliable carbon free source if it's so chooses.

71

00:17:58.530 --> 00:18:17.760

Live Meeting: So, again precious time for nuclear and I couldn't be more excited to be a part of this team and see what it is that we want to focus on to provide the best advice and with that i'm going to ask Dr katie hough Assistant Secretary for nuclear energy to also make some opening remarks.

72

00:18:21.300 --> 00:18:32.190

Live Meeting: Okay, all right thanks so let's go around the table, then for introductions like let's start with you yeah so just if you don't mind clicking the button to speak on your microphone in front of you.

73

00:18:34.770 --> 00:18:37.050

Live Meeting: Good morning i'm like that.

74

00:18:38.100 --> 00:18:41.190

Live Meeting: farmer do a and an RC employee way back when.

75

00:18:42.810 --> 00:18:52.500

Live Meeting: I meant nuclear engineer started off as a in the in the trenches as a admin work over contractor and nuclear submarine testing design and.

76

00:18:53.490 --> 00:19:05.040

Live Meeting: What does the review an engineer last refueling of Nautilus like you're going to come back to some of the history things but, in theory, I worked in Defense programs I worked in civilian waste management.

77

00:19:06.210 --> 00:19:15.990

Live Meeting: Basically, as the acting director and all long term Deputy Director for the locker room officer regular civilian release management.

78

00:19:16.440 --> 00:19:26.190

Live Meeting: I retired when we did the mountain decision in the Bush administration and i've been around helping the Japanese with Fukushima and nothing matters so pleased to be here.

79

00:19:28.950 --> 00:19:35.220

Live Meeting: morning everyone, my name is stu bressler I work for the cgm interconnection, we are a.

80

00:19:36.390 --> 00:19:44.130

Live Meeting: federally approved regional transmission organization responsible primarily for the reliability of the bulk power transmission system.

81

00:19:44.910 --> 00:20:01.980

Live Meeting: I do with tj I am the majority of my career started out really in bulk power systems operations and then kind of evolved into wholesale power markets along the way, and I really spent the majority of my time at PGI am developing an operating wholesale electricity markets.

82

00:20:04.530 --> 00:20:13.230

Live Meeting: So i'm excited to be here nuclear as Maria just went through is a very important part of the resorts portfolio in P diane like in other areas of the country.

83

00:20:14.100 --> 00:20:24.780

Live Meeting: We are, of course, I should say, of course, we are resource agnostic from from ppm standpoint, however, certainly we recognize a lot of the benefits of nuclear energy to Maria went through.

84

00:20:25.470 --> 00:20:33.750

Live Meeting: So this is certainly an important array of issues for us, and I hope that I can be a valuable contribution to the committee so thanks great to be here.

85

00:20:35.490 --> 00:20:38.220

Live Meeting: Just make sure to turn your microphones off when you're done.

86

00:20:41.370 --> 00:20:52.710

Live Meeting: Good morning, everyone i'm Michael forge and i'd like to start by just saying thanks, very much for the opportunity to participate in the committee thanks katie and everyone for inviting me to be part of this wonderful group.

87

00:20:53.880 --> 00:21:06.480

Live Meeting: I am a retired navy captain, and so my my background starts from the national security space and the operating engineers space, I spent 30 years on active duty as a navy nuke.

88

00:21:06.990 --> 00:21:17.040

Live Meeting: At command of a couple of ships and was a senior nuclear engineer on an aircraft carrier and that started my operational engineering experience I did my first factor startup back in the mid 80s.

89

00:21:17.820 --> 00:21:21.090

Live Meeting: So, like Maria have been doing this as an operator for many years.

90

00:21:21.540 --> 00:21:31.950

Live Meeting: After I retired from the navy, I went into the academic space at Carnegie mellon university and Harvard as an academic researcher looking at energy development and economic economic analysis.

91

00:21:32.460 --> 00:21:42.090

Live Meeting: I did, that for about six years and then for the last three years, have been a national lab system currently the associate lab director for engineering at the princeton plasma physics lab I.

92

00:21:42.660 --> 00:21:57.840

Live Meeting: made the transition over to that that other nuclear technology fusion, but my background certainly is mostly in the fusion space, I really look forward to working with a group here and looking at the opportunities may be to provide advice to the.

93

00:21:59.010 --> 00:22:01.020

Live Meeting: Two to end so thanks for having me.

94

00:22:03.630 --> 00:22:09.810

Live Meeting: Good morning, my name is true to your heart and the chief scientist for national and Homeland Security at Idaho national laboratory.

95

00:22:10.350 --> 00:22:17.430

Live Meeting: background his PhD in nuclear engineering, with the emphasis in researching the fuel cycle, I have been at a few national labs.

96

00:22:18.210 --> 00:22:24.930

Live Meeting: are gone Idaho national laboratory and a few others sprinkled in between i'll spare you the detailed resume.

97

00:22:25.860 --> 00:22:42.570

Live Meeting: But i've also worked primarily my career for NSA do we any and also the intelligence community serve some time it's a federal employee in the office of intelligence and counter intelligence at do we were I was the intelligence refer to the secretary of energy.

98

00:22:46.260 --> 00:22:53.130

Live Meeting: Good morning, everybody i'm Alice Kevin at i'm the Deputy Assistant Secretary for reactor fleet and advanced character deployment.

99

00:22:53.610 --> 00:23:09.000

Live Meeting: So I manage our research and development and demonstration portfolio for the existing fleet for getting new reactors in the pipeline, as well as a lot of cross cutting technologies, important for both missions and this support that we have for universities.

100

00:23:12.120 --> 00:23:22.080

Live Meeting: Good morning Andy Griffith Deputy Assistant Secretary for nuclear fuel cycle and supply chain yeah recognize that the reactor is the workhorse of the blueprint energy system.

101

00:23:23.460 --> 00:23:27.090

Live Meeting: My technologies is the other supporting cast, so thank you.

102

00:23:31.170 --> 00:23:39.690

Live Meeting: Good morning i'm Bob Rover I work in the office of nuclear fuel cycle and supply chain and i'm also luke's deputy for this committee.

103

00:23:41.670 --> 00:23:57.210

Live Meeting: Good morning, everyone, my name is Sam brinton I use them them is like pronouns and I am six weeks into the job as the Deputy Assistant Secretary for the office of spent fuel and waste disposition we basically work on high level waste and spent nuclear fuel for the Department of Energy.

104

00:23:59.520 --> 00:24:09.960

Live Meeting: morning everyone john crow and i'm happy to be sitting next to Sam and here with you all today i'm the deputy chief of staff in the office of nuclear energy, so i'll be helping Bob and Luke to ensure that these events are successful, but before.

105

00:24:12.720 --> 00:24:19.470

Live Meeting: morning, my name is Sonia meet i'm a faculty Member at Virginia tech and the Department of science, technology and society.

106

00:24:20.490 --> 00:24:22.410

Live Meeting: So I have an interdisciplinary background.

107

00:24:23.790 --> 00:24:32.940

Live Meeting: i'm not a nuclear engineer, however, I study the history of nuclear reactor design choices and, most recently emergency response.

108

00:24:36.210 --> 00:24:42.660

Live Meeting: Good morning, my name is Lucas Carla i'm an assistant professor in the department of nuclear engineering at uc Berkeley.

109

00:24:43.680 --> 00:24:58.830

Live Meeting: My research is in the area of advanced reactors both fission and fusion and reactor safety and chemistry and i'm really happy to represent to provide the university perspective on this committee thinking through.

110

00:25:00.360 --> 00:25:09.390

Live Meeting: The role that the university plays in knowledge continuity knowledge creation workforce development and the infrastructure that it takes to to provide that.

111

00:25:13.080 --> 00:25:27.960

Live Meeting: morning i'm Kim our pressure metal and I currently work at idle national laboratory my career has been in the national laboratories for 36 years evenly split between Los Alamos Idaho 18 years each and.

112

00:25:29.670 --> 00:25:30.330

Live Meeting: Throughout that.

113

00:25:31.470 --> 00:25:44.760

Live Meeting: At 36 years I have probably been involved in every aspect of nuclear energy mom fashionable therefore another starting from ways to all the way up to advance reactors, I am on the evolved into.

114

00:25:45.900 --> 00:25:48.630

Live Meeting: an accelerator driven systems for a while.

115

00:25:49.980 --> 00:25:54.870

Live Meeting: So thank you and it's an honor to be part of this prestigious group.

116

00:25:56.940 --> 00:26:05.250

Live Meeting: Thank you and good morning, so I also have to preface it that i'm Richard on on the old country boy, and maybe trying to add a sense of.

117

00:26:07.230 --> 00:26:16.140

Live Meeting: Maybe maybe some some logic and and some travel perspective to the group, one of the interesting things is that the tribes have been oftentimes.

118

00:26:16.770 --> 00:26:24.930

Live Meeting: overlooked in a lot of discussions, and I think we're received more proactive and progressive types of interactions and that's greatly appreciated and needed.

119

00:26:26.520 --> 00:26:28.290

Live Meeting: I participate in the.

120

00:26:29.490 --> 00:26:36.570

Live Meeting: department of energy's nuclear energy tribal Working Group, along with a tribal radioactive materials transportation committee.

121

00:26:37.350 --> 00:26:45.240

Live Meeting: Where we have interactions with tribes from throughout the United States, and one of the things that I want to make clear is that while they can provide a.

122

00:26:46.110 --> 00:26:54.930

Live Meeting: Travel perspective i'm not here representing any one particular tribe and that's something that happens on a government, the government basis between the tribes, and the Federal Government.

123

00:26:56.010 --> 00:27:02.730

Live Meeting: Nonetheless, I it's interesting I appreciate it maria's opening remarks, because I think they're there is a big interest in.

124

00:27:03.780 --> 00:27:10.680

Live Meeting: Electricity people getting some and some people just wanting electricity period, some people don't have it, and so I think it's.

125

00:27:11.220 --> 00:27:16.050

Live Meeting: Interesting to bring in those kinds of perspectives and looking at the small majority actors is a lot of.

126

00:27:16.380 --> 00:27:26.970

Live Meeting: interest in that up you know in Alaska in some of the remote areas and so when we can broker some discussions there and try to have some interactions I think that's going to be something that will be helpful.

127

00:27:27.690 --> 00:27:35.700

Live Meeting: For for the group so again it's nice to see everybody here and here all the scientific foundations for what we're doing.

128

00:27:36.570 --> 00:27:47.700

Live Meeting: In my My hope is that we we add a sense of consciousness to that, so we have a science, with a conscience and making sure that we're doing the right thing and moving things forward, thank you, thank you very much.

129

00:27:53.010 --> 00:28:09.570

Live Meeting: Well, thank you very much, you just reinforced just how an esteemed group, in fact, that we are, and right now i'd like to turn it over to Dr katie huff and you can talk to us about nuclear energy priorities, Dr have.

130

00:28:10.830 --> 00:28:13.080

Live Meeting: Thank you again Maria I think.

131

00:28:14.760 --> 00:28:17.940

Live Meeting: Yes, you are an incredibly esteemed group, I think.

132

00:28:18.960 --> 00:28:24.930

Live Meeting: The critical component here is that the next few hours you'll be hearing about what the opposite of nuclear energy is up to.

133

00:28:25.470 --> 00:28:35.550

Live Meeting: And we'll be looking to you to help us direct that ship help us align our strategic missions and priorities with our actions.

134

00:28:36.420 --> 00:28:44.340

Live Meeting: And all of your perspectives will be helpful here, everything is fair game, and you know that will be followed by lunch and then of course discussions.

135

00:28:45.090 --> 00:28:51.360

Live Meeting: That you lead this is your committee directing what you think we need direction and advice for, so I hope you'll.

136

00:28:51.840 --> 00:28:59.280

Live Meeting: sort of listen to what I think our priorities are you'll hear from our specific technology offices to understand what it is they're working on.

137

00:28:59.850 --> 00:29:07.920

Live Meeting: And I look forward to your feedback and guidance in all of these areas so let's talk a little bit about the snapshot here so.

138

00:29:08.700 --> 00:29:17.700

Live Meeting: The annual appropriations in the office of nuclear energy, really drive what's possible it's scopes the scale of what we can do.

139

00:29:18.660 --> 00:29:24.000

Live Meeting: Right now, we have an incredible opportunity as Maria mentioned.

140

00:29:24.480 --> 00:29:34.260

Live Meeting: You know this is a time when we have resources for the office of nuclear energy that we haven't had in the past, and some of it has expanded past the office of nuclear energy.

141

00:29:35.040 --> 00:29:55.620

Live Meeting: into a space of other offices engaged in nuclear equities, so our fyi 23 budget request was about $1.7 billion, which is one of the largest budget requests in American history for the office of nuclear energy, if you look back in history, you can see how it's been modestly growing.

142

00:29:56.790 --> 00:30:02.700

Live Meeting: And we're really excited about what can be possible here, in addition to all of that.

143

00:30:03.660 --> 00:30:16.830

Live Meeting: The advanced reactor demonstration demos were funded through the bipartisan infrastructure law with $2.5 billion to support the Atrium reactor and the X energy xe 100 reactors full deployment.

144

00:30:17.340 --> 00:30:24.720

Live Meeting: Those $2.5 billion are going to be over the course of the coming years, supporting those demonstration reactors.

145

00:30:25.110 --> 00:30:37.170

Live Meeting: In the office of clean energy demonstrations, so you know that's $2.5 billion existing outside of the office of nuclear energy being managed by the office of clean energy demonstrations toward our mission.

146

00:30:37.680 --> 00:30:45.870

Live Meeting: So we will be working closely with them and are already working closely with them within do we to see those succeed.

147

00:30:46.620 --> 00:31:01.350

Live Meeting: Similarly, the civil nuclear credit program was stood up by the bipartisan infrastructure law was $6 billion over the next 10 years and that, too, will be operated within the infrastructure undersecretary it outside of the office of nuclear energy.

148

00:31:01.620 --> 00:31:12.600

Live Meeting: In the grid deployment office and that $6 billion will help economically struggling nuclear facilities plants that have struggled and difficult markets.

149

00:31:13.470 --> 00:31:28.920

Live Meeting: And those those plants will then have some opportunity to save themselves from immediate closure, we in the office of nuclear energy, stood up that program and its first months and we are in the process of transitioning it over to that grid deployment office.

150

00:31:30.030 --> 00:31:37.290

Live Meeting: But that's again a $6 billion amount that's operating outside of the opposite nuclear energy, the core to our mission.

151

00:31:37.680 --> 00:31:47.430

Live Meeting: And so you can see how the department is sort of expanding that cross cutting nature of nuclear much like other clean energy technologies, find a place in that new infrastructure secretariat.

152

00:31:47.880 --> 00:31:56.430

Live Meeting: Additionally, the bipartisan infrastructure la past $8 billion for hydrogen hubs regional hydrogen homes, there will be four of them, and it at least one of one of the.

153

00:31:57.030 --> 00:32:02.220

Live Meeting: Sorry there won't necessarily be for them, there will be at least for them, and at least one of those will be nuclear.

154

00:32:03.150 --> 00:32:10.380

Live Meeting: You know, I think that direction from Congress is pretty clear that we want to see significant nuclear participation in those hydrogen hubs.

155

00:32:11.130 --> 00:32:17.940

Live Meeting: And so those regional hydrogen homes, of course, also will be deployed in the office of clean energy demonstrations again.

156

00:32:18.480 --> 00:32:21.690

Live Meeting: space where there'll be focused on the creation of hydrogen.

157

00:32:22.050 --> 00:32:30.300

Live Meeting: But expansively considering different clean energy technologies, one of which is directed by Congress to be nuclear again an equity in our mission.

158

00:32:30.600 --> 00:32:42.900

Live Meeting: outside of this office but contributing, so we contribute through direct collaboration technically in that endeavor with the new office of clean energy demonstration space that's deploying this hydrogen house.

159

00:32:44.160 --> 00:32:51.360

Live Meeting: That the inflation reduction Act has a lot going on in it, this is the.

160

00:32:52.740 --> 00:32:56.610

Live Meeting: deal that Center mansion and.

161

00:32:57.690 --> 00:33:07.980

Live Meeting: Senator schumer have reached recently and we're hoping to see that move through Congress quickly this inflation reduction Act has a lot of nuclear equities in it, but a few that all just note.

162

00:33:08.310 --> 00:33:15.960

Live Meeting: Is that it does incorporate $700 million for high as a low enriched uranium, which we will need for advanced nuclear demonstrations.

163

00:33:16.230 --> 00:33:25.440

Live Meeting: and advanced nuclear commercialization of the second, third, fourth, fifth of a kind of these advanced reactors, hopefully, all the way up to 300.

164

00:33:26.190 --> 00:33:40.650

Live Meeting: As Maria was indicating there's also an opportunity for production tax credit there's national lab infrastructure dollars there's all kinds of things happening in this bill and we'll watch it very closely, as it moves forward.

165

00:33:42.180 --> 00:33:47.670

Live Meeting: We have a few key priorities so i'll talk through those they all have to fit inside this budget.

166

00:33:49.380 --> 00:34:00.510

Live Meeting: Which is my daily task actually you know we have a lot of focus, but you know it's critically important that we balance, the importance of responsibility with taxpayer dollars our mission and our priorities.

167

00:34:01.170 --> 00:34:09.150

Live Meeting: The top priority is keeping existing plants open we do this through a number of programs and you'll hear all about some of them.

168

00:34:09.900 --> 00:34:18.870

Live Meeting: We focus on work to digitize our analog systems for existing control and operation nuclear plants.

169

00:34:19.620 --> 00:34:38.280

Live Meeting: Providing technical analysis for continued long term operation, ie license extensions for existing plants, the science that do we R amp D supports helps the nuclear regulatory Commission confidently decide on license extensions with data that they can trust from the national laboratories.

170

00:34:39.810 --> 00:34:54.720

Live Meeting: we're working on accident tolerant fuels alongside industry identifying new markets as Maria was talking about, with regard to direct process heat hydrogen production advanced materials and fuels that can be produced through direct process heat even district heating.

171

00:34:56.430 --> 00:35:05.100

Live Meeting: And, of course, hydrogen production is a critical component, we have a number of hydrogen demonstrations already started in addition to the demos, which will come out soon.

172

00:35:05.970 --> 00:35:14.730

Live Meeting: So what it looks like here, and you may see the slide again because it sort of underpins a lot of our work in advanced reactors in the existing fleet, but today, most of our baseload.

173

00:35:15.180 --> 00:35:25.230

Live Meeting: Is from and I, you know shamelessly stole this from Alice who hopefully you'll see it again, but today we have baseload nuclear that provides electricity demand demand generation.

174

00:35:25.740 --> 00:35:33.420

Live Meeting: But in the future, there could be a variety of different reactors, providing a variety of different products through both he and electricity.

175

00:35:33.720 --> 00:35:39.270

Live Meeting: We hope to see clean water, come from this through desalination hydrogen production industrial applications.

176

00:35:39.780 --> 00:35:47.220

Live Meeting: electricity generation that isn't just baseload but captures the capability of advanced storage systems attached to advanced reactors, as well as.

177

00:35:47.550 --> 00:35:54.900

Live Meeting: Advanced reactors that have the ability to load follow with the critical reactor physics helmet reactors that are no longer tied.

178

00:35:55.410 --> 00:36:05.520

Live Meeting: To the people stresses limitations or thermal stress limitations that previous reactors may have been, and all of that will allow us to work more effectively.

179

00:36:05.820 --> 00:36:16.380

Live Meeting: With renewables on the grid with other clean and low carbon energy sources and the sort of fundamental restrictions of our 24 seven need for electricity that's reliable.

180

00:36:18.450 --> 00:36:32.190

Live Meeting: So we use hydrogen already in a number of applications out in the world, and there is a market already so there's an opportunity here for existing lightwater reactors to begin to participate in that mark.

181

00:36:32.910 --> 00:36:42.960

Live Meeting: And we have four alongside era we have four demonstrations at different reactors around the country that are already being stood up to begin producing hydrogen.

182

00:36:43.590 --> 00:36:53.460

Live Meeting: Through various types of electrolysis so we've got a demonstration with two demonstrations with PM a high temperature electrolysis sorry.

183

00:36:54.420 --> 00:37:04.470

Live Meeting: steam and whatnot so we have four locations prairie island aloe Vera day Davis bessie and 99 point which will soon be producing hydrogen with their existing electricity to reduce the times when.

184

00:37:05.940 --> 00:37:21.660

Live Meeting: You know when the sun is shining you don't need as much nuclear electricity on the grid, and this will enable them to offload that to a valuable product hydrogen which they can then be fed back through fuel cells into the electric grid or sent out to the market as hydrogen fuel product.

185

00:37:23.880 --> 00:37:34.230

Live Meeting: So you know there's a lot of use cases we've talked through a few of these and i'm sure Alice will go through them, but you know there's remote applications and chemical processing locations there's.

186

00:37:34.620 --> 00:37:44.610

Live Meeting: sort of shipping opportunities and dense urban requirements for batteries, is a great image from third way, and I think there's even more, as we think about the future, but.

187

00:37:44.970 --> 00:37:55.380

Live Meeting: It may be remote mining towns, it may be urban hospitals that require reliable power, instead of backup diesel contemplate a micro reactor.

188

00:37:56.910 --> 00:38:07.860

Live Meeting: Alright, our next priority is this building advanced reactors, so, in addition to keeping existing reactors open and exploring new markets advanced reactors play a role in the transition.

189

00:38:08.790 --> 00:38:15.210

Live Meeting: You know, we have a lot that will be talked about in terms of fuel development and design and this priority is critical.

190

00:38:16.530 --> 00:38:22.890

Live Meeting: Because we must advance with the many decades of knowledge that we've developed over the course the La.

191

00:38:23.490 --> 00:38:34.890

Live Meeting: times since the last time we were building plants regularly we know a lot more now there are advanced fuels that offer incredible safety which is reassuring to the public when we serve.

192

00:38:36.180 --> 00:38:45.990

Live Meeting: It can help with our energy justice initiatives to ensure that the hosts of these devices feel more safe and, in fact, are more safe.

193

00:38:46.770 --> 00:38:55.110

Live Meeting: For the more advanced materials and manufacturing should reduce the cost of these advanced reactors in the long term, as they become more modular.

194

00:38:55.860 --> 00:39:11.280

Live Meeting: there's different sizes that we're exploring micro, small and large scale reactors have all have opportunities in the market, we still have international interest in very large scale gigawatt reactors and very soon you'll see the two vocal plants in Georgia, turning online.

195

00:39:13.140 --> 00:39:20.490

Live Meeting: But, additionally, you know small modular reactors are close to the size of a lot of existing retiring coal plants, this is an opportunity for us.

196

00:39:20.940 --> 00:39:32.160

Live Meeting: To bring along communities as this energy transition progresses, as we approach a clean energy transition here in the United States, we cannot leave communities behind.

197

00:39:32.760 --> 00:39:41.880

Live Meeting: and small modular reactors offer an opportunity to replace retiring coal plants leverage existing infrastructure, like high voltage power lines.

198

00:39:42.420 --> 00:39:51.510

Live Meeting: cooling water capability and other infrastructure, but also the workforce and the communities in those locations that will need to be brought on brought along in that transition.

199

00:39:52.080 --> 00:40:02.340

Live Meeting: As many of us know a nuclear plant is very similar to a coal thermal plant a lot of the auxiliary systems are the same, you need a lot of the same steam turban on like management and.

200

00:40:02.640 --> 00:40:16.290

Live Meeting: Maintenance operators, you need Boilermakers and electricians welders etc, and so similar needs and then my girl reactors have very specific needs applications that we can explore for specialized.

201

00:40:17.640 --> 00:40:33.990

Live Meeting: needs in remote areas or backup power so we'd like to build a lot of these, and we have a real direction here where we'd like to see some of these plans built over the course of a long timeline you know a lot of this will be talked about again, this is the analysis area, so our.

202

00:40:35.250 --> 00:40:48.780

Live Meeting: fans reactors section a little dive a little deeper, but this timeline presents a number of ambitions that we have about testing micro reactors in the coming couple of years, deploying sm ours, through our demonstration Program.

203

00:40:49.170 --> 00:41:06.090

Live Meeting: Reducing the risk of advanced reactors like kairos is designed through risk reduction awards in our advanced reactor demonstration program and finding ourselves with multiple deployments in this decade, I hope to see Tara powers new term reactor built in wyoming X energies.

204

00:41:07.230 --> 00:41:21.180

Live Meeting: built in Washington, the US new scale partnership building their carbon free power project new skill Voyager six six pack in Idaho and many more that you see on this slide.

205

00:41:23.130 --> 00:41:35.130

Live Meeting: So Alice will talk a great deal about this as well, but you know we have a vision of enabling these advances in the long term, through infrastructure deployments at that nuclear reactor and innovation Center which is not just a place of course this.

206

00:41:36.150 --> 00:41:47.370

Live Meeting: As Alice will dive into but a network of capabilities throughout the national laboratories in our broader federal infrastructure to enable advanced reactor developers to innovate.

207

00:41:49.230 --> 00:41:55.980

Live Meeting: So I you know we have this E br to Dome that will be ready for testing micro reactors.

208

00:41:56.820 --> 00:42:00.660

Live Meeting: As well as other facilities which Alice will have an opportunity to discuss.

209

00:42:01.110 --> 00:42:07.440

Live Meeting: But i'd like to just kind of walk through some of the advanced reactors that we're supporting just so you have a notion of the landscape of his priority.

210

00:42:07.860 --> 00:42:15.000

Live Meeting: The advanced reactor demonstration program isn't, the only way we support advanced reactors and again Alice will dive deeper into this, but you know the to.

211

00:42:15.780 --> 00:42:23.940

Live Meeting: DEMO reactors that are now part of the office of clean energy demonstration mission are the sodium cool faster actor from Atrium and the.

212

00:42:25.680 --> 00:42:37.770

Live Meeting: Which is a high temperature gas reactor with pebble fuel and these two devices, we hope, will be deployed in this decade, but a critical component of their success will be licensing.

213

00:42:38.610 --> 00:42:51.390

Live Meeting: and fuel with the bipartisan infrastructure law we have secured release from another risk which is appropriate annual appropriations risk, I think there were sort of three major risks facing these two demos right.

214

00:42:52.050 --> 00:42:57.000

Live Meeting: The first being appropriations risk which is solved by this bipartisan infrastructure law injection.

215

00:42:57.300 --> 00:43:12.810

Live Meeting: Of $2.5 billion, but the other two store main continued forward movement and their licensing will progress and hopefully with collaboration through that are C and D, we should see success in those timelines but a final component will be fuel we'll talk about that in a second.

216

00:43:14.700 --> 00:43:24.240

Live Meeting: In addition to those two demonstration reactors which are targeted to be deployed in this decade, we expect that in the next 10 to 14 years there are these five reactors that we're supporting.

217

00:43:24.930 --> 00:43:30.600

Live Meeting: For deployment in longer term that includes us on Mars, like the whole tech ASMAR 160.

218

00:43:30.900 --> 00:43:39.210

Live Meeting: As well as Michael reactors, like the Vinci, you know we're really excited about all these reactors, the banner reactor from universities and other micro reactor design.

219

00:43:39.570 --> 00:43:52.500

Live Meeting: The KPI HR is the kairos design, which will be sort of experiment through the Hermes experiment leading up toward a commercial deployment and the mountain forward fast reactor which led by southern company is also a terror power design.

220

00:43:55.200 --> 00:44:05.370

Live Meeting: And there are reactors even further from commercialization which still have some opportunity to advance through the advanced record demonstration program, and that includes these three from.

221

00:44:06.150 --> 00:44:13.110

Live Meeting: Advanced reactor concepts MIT in general atomics respectively, we expect those to be more ready by the MID 2013.

222

00:44:14.190 --> 00:44:23.670

Live Meeting: These are just an example of the kinds of reactors that we support and the advanced reactor demonstration program is our biggest direction there, but there are lots of other ways that we support other companies, we have.

223

00:44:24.480 --> 00:44:39.120

Live Meeting: National laboratory collaborations at Idaho and other labs argon oakridge etc that support the development of other commercial endeavours, supported by any both in kind, and through direct support of our national laboratory missions.

224

00:44:40.200 --> 00:44:48.510

Live Meeting: I will say one that's not on this list is the new scale reactor, which is an example of water cooled small modular reactors that we do see.

225

00:44:48.780 --> 00:44:57.990

Live Meeting: As ready to deploy within this decade, the new scales more modular reactor, for example, is of great interest to the international community, because it does have designed certification from.

226

00:44:58.380 --> 00:45:13.800

Live Meeting: The nuclear regulatory Commission which is very helpful in the confidence that we see from international interests they are much more confident in this design because it's it's overcome quite a bit of that licensing risk hurdle.

227

00:45:15.030 --> 00:45:25.050

Live Meeting: There are additional water cooled small modular reactors that may be ready to deploy within this decade, including, for example, the Snr 160 that we mentioned but potentially the G.

228

00:45:26.910 --> 00:45:35.130

Live Meeting: There is a long list of reactors that through its history, do any has supported and we hope that to see those small modular actors leverage.

229

00:45:35.610 --> 00:45:46.350

Live Meeting: The capability of factory fabrication and modular deployment for a reduction in costs and an improvement in their success on the markets that they'd like to deploy in.

230

00:45:48.480 --> 00:45:59.220

Live Meeting: You know I think it's really important to talk a little bit about our next priority, which is international nuclear cooperation, we would really like to expand.

231

00:45:59.670 --> 00:46:06.180

Live Meeting: Our international new quote nuclear cooperation in a context today where as Maria mentioned.

232

00:46:06.840 --> 00:46:25.560

Live Meeting: Energy security is national security and it's recognized more clearly broadly, not just in Europe and elsewhere, that we have an opportunity to lead the world again in nuclear energy by partnering with our peaceful democratic allies and encouraging safin.

233

00:46:26.880 --> 00:46:38.250

Live Meeting: US technologies abroad, and now we have over time last what was leadership in operational power by nuclear reactors, but we continue to have the largest fleet in the world.

234

00:46:38.910 --> 00:46:44.460

Live Meeting: And there is an opportunity opportunity for us to continue to have an incredibly large fleet we do maintain.

235

00:46:44.760 --> 00:46:52.380

Live Meeting: That you know leadership across the world, but you know, there are a lot of other nations that now have this incredible growth of nuclear we see.

236

00:46:52.860 --> 00:47:01.170

Live Meeting: You know Asia cooling with incredible speed towards an incredible amount of nuclear France, of course, has really big goals now.

237

00:47:01.830 --> 00:47:06.390

Live Meeting: With the recent announcements from the French President, you know we're seeing a real.

238

00:47:07.080 --> 00:47:15.480

Live Meeting: growth across Europe in the interest in these kinds of things, but these are all opportunities every every country on this list is an opportunity to collaborate.

239

00:47:15.780 --> 00:47:32.700

Live Meeting: To expand our standards of safety and reliability safeguards and security, and when we have nuclear reactors of any kind deployed anywhere nuclear leadership in the United States it's really important for us to have a voice in how those reactors are operated and maintained.

240

00:47:33.810 --> 00:47:41.940

Live Meeting: And we have a lot of opportunities to cooperate internationally through academic collaborations or national laboratory collaboration.

241

00:47:42.180 --> 00:47:50.040

Live Meeting: but also through corporate deployments and stuff like that, so this is another way to look at this graph actually so the.

242

00:47:50.610 --> 00:48:01.350

Live Meeting: World nuclear energy market has been projected to need to double by 2050 the International Energy Agency, for example, things it will have to double in order for all the nations in the world to meet our.

243

00:48:02.760 --> 00:48:03.990

Live Meeting: promises for the climate.

244

00:48:06.510 --> 00:48:17.790

Live Meeting: The US exports could be gigantic in the trillions of dollars and but today, Russia does dominate global nuclear technology exports, and I think it's a reminder for how we can.

245

00:48:19.560 --> 00:48:32.010

Live Meeting: We can take on an opportunity to provide a trustworthy partner for our international democratic, peaceful allies were less trustworthy partners may have previously held their attention.

246

00:48:33.960 --> 00:48:38.760

Live Meeting: kind of is ramp ramp up ramping up exports and there's you know the regulatory.

247

00:48:40.500 --> 00:48:53.550

Live Meeting: agency in the UK has recently began to evaluate and china's Paul on one design and we do we just struggled to compete with financing back by state owned nuclear technology companies.

248

00:48:54.330 --> 00:49:03.540

Live Meeting: In nations like that, but I think we do have an opportunity to lean on our nuclear leadership and cooperation to enable trustworthy partnerships in this endeavor.

249

00:49:04.860 --> 00:49:15.660

Live Meeting: there's a there's a whole lot of engagements we can talk about here, but you know there's a lot of opportunities here to help growing nations and to engage in in future deployments.

250

00:49:16.920 --> 00:49:33.870

Live Meeting: i'll sort of recognizing time i'll just say you know, not all of the nations that we would like to collaborate with have 123 agreements and there's an opportunity here for us to work within the inner agency from this office to enable those deployments.

251

00:49:34.890 --> 00:49:40.710

Live Meeting: Alright, one more piece on international nuclear energy cooperation gets to the workforce component.

252

00:49:41.310 --> 00:49:55.800

Live Meeting: This is a graph which academics will recognize as the degree Count of nuclear engineering degrees in the United States over time, the orange is bachelor's degrees yellow his master's degrees and great is PhDs.

253

00:49:56.820 --> 00:50:07.290

Live Meeting: You can see that in the early early days of nuclear engineering degrees, there was a peak and enthusiasm and then, as the economics of nuclear dropped off in that.

254

00:50:08.550 --> 00:50:12.990

Live Meeting: We saw fewer and fewer degrees and degree programs across the United States.

255

00:50:14.310 --> 00:50:18.690

Live Meeting: But then there's some magic that happens right about when I was graduating high school.

256

00:50:19.890 --> 00:50:29.040

Live Meeting: Where there was a lot of interest in clean energy and that's bird what is now the current generation of nuclear students and young nuclear professionals.

257

00:50:30.030 --> 00:50:43.980

Live Meeting: Many of whom like myself are beginning to take on leadership positions and guide and clear in a climate driven way and sorry and we've recovered, a great deal, but not all and not enough of the workforce that we will need.

258

00:50:46.140 --> 00:50:49.350

Live Meeting: But there's another line on this graph that i'd like to draw your attention to.

259

00:50:50.730 --> 00:50:59.730

Live Meeting: there's also the research reactors deployed in the United States, this blue line is the number of operating nuclear research reactors in the United States, and this is, you know.

260

00:51:00.060 --> 00:51:11.730

Live Meeting: What it shows is that as those nuclear engineering departments declined their research reactors which accompany their programs and gave hands on experience to those students were shut down.

261

00:51:14.460 --> 00:51:25.680

Live Meeting: But none have recovered we've had a monotonic decrease right and that creates a widening gap as interest in nuclear reactors grows.

262

00:51:26.130 --> 00:51:32.910

Live Meeting: The available research reactors for hands on engagement with that technology has not grown with it.

263

00:51:33.570 --> 00:51:44.280

Live Meeting: that's true for us but it's also true for our international allies, where they're envisioning a future of deployment of research of advanced reactors within.

264

00:51:44.940 --> 00:51:55.410

Live Meeting: other nations there's not necessarily that infrastructure for hands on engagement with the workforce that they're going to need to build up that's true here and it's true in the.

265

00:51:55.800 --> 00:52:01.560

Live Meeting: democratic, peaceful partners that we would like to you know help deploy nuclear reactors and so.

266

00:52:01.950 --> 00:52:15.870

Live Meeting: I want to just draw your attention to this need not just here but everywhere, some of this can be satisfied by reactor simulators in those nations right control systems that mimic the experience of the operating room the.

267

00:52:17.640 --> 00:52:24.090

Live Meeting: Control room of an operating reactor and they can be more easily traded out for different advanced reactor types, but.

268

00:52:25.800 --> 00:52:33.180

Live Meeting: It is definitely how many of you in this room, have worked with a research reactor as a student or yeah.

269

00:52:33.870 --> 00:52:43.230

Live Meeting: See it's like credibly important for those of us with had that experience you know if you've operated a real reactor, you have better intuition, for it better intuition proud to design it and keep it safe so.

270

00:52:43.620 --> 00:52:50.460

Live Meeting: it's something that i'd like to note in terms of our international cooperation it touches on our academic and workforce development be behavior.

271

00:52:52.230 --> 00:52:56.490

Live Meeting: Nearly eight more minutes okay great perfect.

272

00:52:59.040 --> 00:53:08.430

Live Meeting: The first priority i'll talk about is securing and sustaining the fuel cycle, the whole full circle, the front and the back, we must secure the front front and sustain the back.

273

00:53:09.900 --> 00:53:19.200

Live Meeting: Right now, we have a critical issue with uranium supply and the United States, and you will hear some more about it from Andy, I think, but i'll just say that.

274

00:53:20.640 --> 00:53:26.220

Live Meeting: Russia provides 20% of our enriched uranium for the existing fleet in the United States.

275

00:53:28.050 --> 00:53:40.650

Live Meeting: Primarily, they do this through providing conversion and enrichment services while mind uranium has a more diverse set of suppliers across the globe Russia dominates the enrichment market and.

276

00:53:42.480 --> 00:53:49.740

Live Meeting: As we look towards sources of our fuel, not just for nuclear but other other sources of fuel for other.

277

00:53:50.220 --> 00:54:03.990

Live Meeting: Production types across the world and trustworthy untrustworthy sources of fuel really undermine our energy security, including this one, and so here in the United States we've actually had a decline in our capability to.

278

00:54:05.520 --> 00:54:15.750

Live Meeting: fully support the front end of the fuel cycle, we have only one enrichment facility and currently not operating conversion facility.

279

00:54:16.980 --> 00:54:25.740

Live Meeting: The conversion facility congregation is restarting but will need to restart it a higher capacity than it was planning on if we are to have any chance of filling the gap left behind.

280

00:54:26.160 --> 00:54:36.690

Live Meeting: By this Russian fuel supply now all of this is in the important context of things like the energy justice questions around mining in the United States.

281

00:54:37.260 --> 00:54:49.650

Live Meeting: And this administration has a really powerful mission to incorporate energy and environmental justice in all of our decisions, including, for example, how we secure our supply of uranium.

282

00:54:50.400 --> 00:54:57.690

Live Meeting: And so there's a nuanced approach that will need to take to the supply and provision are uranium and the Standing up have a.

283

00:54:58.020 --> 00:55:13.260

Live Meeting: more robust supply chain that will have to recognize the dark history of uranium mining, in particular in the United States, while simultaneously recognizing the existential crisis that could be created by lack of fuel supply for any of our energy sources so.

284

00:55:14.550 --> 00:55:20.220

Live Meeting: We have developed uranium strategy in the in the Department of Energy, which proposes.

285

00:55:21.660 --> 00:55:28.230

Live Meeting: to procure low enriched uranium from new capacity, including high as a low enriched uranium in the United States.

286

00:55:29.160 --> 00:55:42.090

Live Meeting: We don't you have appropriations or all the authorizations we would necessarily need to do this, but we are working through the White House and with our colleagues in Congress to develop support for that endeavor.

287

00:55:43.590 --> 00:55:56.400

Live Meeting: In addition to this, of course, all of our many of our advanced reactors, certainly not all but many of our advanced reactor deployments will require high ass a loner geranium so that's low and Richard radium up to 20%.

288

00:55:56.910 --> 00:56:04.800

Live Meeting: existing fleet it's more like 5% but up to up to 20% and we don't currently have a capability here in the United States to.

289

00:56:05.250 --> 00:56:12.270

Live Meeting: Do that a commercial scale, the only commercial scale high as a low enriched uranium supplier in the world is 10 X in Russia.

290

00:56:13.140 --> 00:56:21.660

Live Meeting: So we would like to stand up more of that capacity as well, so an Andy will talk at some length about this, but we, we certainly have a demonstration capability.

291

00:56:22.410 --> 00:56:29.730

Live Meeting: That is being developed in piped in Ohio and part of our uranium strategy will incorporate additional capacity for this high as a low enriched uranium.

292

00:56:31.620 --> 00:56:36.540

Live Meeting: I just talked through this a little bit, but I, you know, notably this $700 million in the.

293

00:56:37.380 --> 00:56:47.910

Live Meeting: Inflation reduction act will help toward this high asked a low enriched uranium availability, you know here's some details about sort of what it is, it does allow for those smaller designs and longer lived corps.

294

00:56:48.750 --> 00:57:08.730

Live Meeting: Better fuel efficiency and utilization and therefore smaller volume of waste, we do have you know a lot of endeavors here to sort of set up this capacity in the United States in a secure in and sustainable way, but it does require new centrifuges and newly licensed facilities.

295

00:57:10.740 --> 00:57:16.980

Live Meeting: So, in the last four minutes i'll touch on a topic which I know we'll talk a lot about is spent nuclear fuel so.

296

00:57:17.520 --> 00:57:29.100

Live Meeting: In addition to securing the front end of our fuel cycle, we should find a sustainable way to manage the back end excited to have a new Deputy Assistant Secretary leading this who has an incredible passion for this topic.

297

00:57:30.450 --> 00:57:39.480

Live Meeting: And you know what it's going to require is revamping our strategy we have restarted a consent based citing approach to building an interim storage facility.

298

00:57:40.320 --> 00:57:55.980

Live Meeting: We are developing rail cars and performing R amp D on the advanced types of fuels that will need to be responsible for and we're integrating Spent Fuel Management in some some of our international approaches, we see here are a variety of casks out at Idaho national laboratory.

299

00:57:57.660 --> 00:58:04.800

Live Meeting: So, you know as we think about this, you know the scale of the challenge is 2000 metric tons a year.

300

00:58:05.610 --> 00:58:11.610

Live Meeting: that's the same you know 2000 metric tons of go in and the front end they come back out every year in the back end 2000 a year.

301

00:58:12.120 --> 00:58:28.980

Live Meeting: And this number, you know is physically it's physically small but the communities that currently have those fuel casks at their reactor sites do not sign up for it, we in the Department of Energy are required to begin removing that material from the sites, at which he currently sits.

302

00:58:30.420 --> 00:58:32.850

Live Meeting: According to the nuclear waste policy act and.

303

00:58:33.960 --> 00:58:42.060

Live Meeting: Those communities didn't sign up for long term storage and it is our duty to provide a solution that allows do we to take responsibility.

304

00:58:42.450 --> 00:58:50.820

Live Meeting: and begin managing that spent nuclear fuel so restarting a consent based signing process for this federal interim storage facility is critically important.

305

00:58:51.300 --> 00:59:08.730

Live Meeting: Biden Harris administration has stated that the mountain repository is not a workable solution as a final repository, but we do have federal dollars to move forward with our strategy for developing an interim storage facility, while we evaluate other options for final disposal.

306

00:59:09.960 --> 00:59:20.340

Live Meeting: What I will say is that it's dense, it is a big challenge, politically, but a small challenge physically because of this incredible energy density and so.

307

00:59:20.880 --> 00:59:32.400

Live Meeting: There is hope, and I personally really love this cartoon which is just great fun OK, I will say there's a lot of other cross cutting priorities that I would love to spend a great deal of time on.

308

00:59:33.300 --> 00:59:48.690

Live Meeting: We do need to champion real climate motivated workforces in our nuclear space and foster a culture of inclusion and diversity, these are critical White House priorities that we have tried to incorporate across office, and we look forward to ways to improve those.

309

00:59:49.800 --> 00:59:57.180

Live Meeting: This includes environmental and energy justice, you know i've touched on some of this throughout some of these comments, but there are.

310

00:59:58.050 --> 01:00:07.380

Live Meeting: incredible number of ways in which we should be better incorporating energy and environmental justice, in particular, you know embedding that justice into both our processes.

311

01:00:08.010 --> 01:00:19.770

Live Meeting: And in our you know actual work deployments etc, and finally, of course, jobs in the American workforce, you know as we put these processes in place keeping Americans.

312

01:00:20.100 --> 01:00:33.090

Live Meeting: Fully employed and engaged in a pipeline that's going to enable or clean energy transition is going to be truly critical so that's it Thank you sorry for rushing last three slides I think actually the last three sides as well, we have a lot of discussion.

313

01:00:34.290 --> 01:00:36.210

Live Meeting: I took up all the time what's next okay.

314

01:00:37.500 --> 01:00:48.930

Live Meeting: Great Thank you we will go ahead and do a quick coffee break and reconvene at 10:15am with a presentation from jack Goodman on nuclear energy in the global context.

315

01:02:28.620 --> 01:02:29.070

working.

316

01:02:52.620 --> 01:02:53.790

And I will give me enough time.

317

01:03:35.970 --> 01:03:36.450

Hello.

318

01:10:20.400 --> 01:10:21.090

very much.

319

01:10:51.030 --> 01:10:51.480

well.

320

01:10:52.710 --> 01:10:53.070

I thought.

321

01:10:56.070 --> 01:10:57.180

We could do, but I think.

322

01:11:07.080 --> 01:11:07.590

For.

323

01:11:16.560 --> 01:11:16.890

Yes.

324

01:11:34.020 --> 01:11:34.380

alright.

325

01:12:38.070 --> 01:12:38.820

yeah.

326

01:13:12.030 --> 01:13:12.900

Jac Goodman - DOE/NE-6: Can you hear me.

327

01:13:14.160 --> 01:13:14.880

Jac Goodman - DOE/NE-6: yep we can hear you.

328

01:14:08.310 --> 01:14:15.720

Live Meeting: Okay folks we're going to get started here in two minutes, so if you could make your way back to your seats we'll get started just shortly.

329

01:15:36.990 --> 01:15:39.450

Live Meeting: hey if folks could take their seats, please.

330

01:15:46.470 --> 01:15:54.600

Live Meeting: All right, thank you very much we'll go ahead and get started, and I will turn it back over to Assistant Secretary huff to introduce our next speaker.

331

01:15:56.400 --> 01:16:10.650

Live Meeting: Thank you, and our next speaker will be associate Deputy Assistant Secretary jack Goodman who will be talking about our international nuclear energy cooperation endeavors and jack I think is on.

332

01:16:10.710 --> 01:16:11.850

line so.

333

01:16:13.320 --> 01:16:13.980

Live Meeting: jack.

334

01:16:14.610 --> 01:16:15.330

Jac Goodman - DOE/NE-6: Can you hear me.

335

01:16:15.480 --> 01:16:19.440

Live Meeting: We certainly can we can even see you so great success.

336

01:16:20.010 --> 01:16:23.130

Jac Goodman - DOE/NE-6: With not too much of a booming voice from above, but.

337

01:16:24.780 --> 01:16:35.970

Jac Goodman - DOE/NE-6: Thank you, Dr huff for the introduction i'm speaking today as our Deputy Assistant Secretary alicia Duncan is that oakridge national lab laboratory early this week hosting a Brazilian delegation.

338

01:16:36.840 --> 01:16:47.130

Jac Goodman - DOE/NE-6: They will be traveling to Washington later this week for some bilateral meetings, but unfortunately alicia Duncan was not able to attend but looks forward to joining future meetings next slide please.

339

01:16:48.930 --> 01:16:55.860

Jac Goodman - DOE/NE-6: So what i'd like to do this morning is to provide a very brief overview of any six the office of international nuclear energy policy.

340

01:16:57.000 --> 01:17:04.440

Jac Goodman - DOE/NE-6: and cooperation and its mission and then focus on the current landscape for our office and the broader us government's efforts to promote us.

341

01:17:05.340 --> 01:17:09.120

Jac Goodman - DOE/NE-6: To technological and industrial leadership in nuclear around the world.

342

01:17:09.660 --> 01:17:21.780

Jac Goodman - DOE/NE-6: In particular, I want to highlight what are the key opportunities and challenges that any six is currently focused on in the international space and on which we look forward to hearing the perspectives of net members going forward next slide please.

343

01:17:23.970 --> 01:17:33.780

Jac Goodman - DOE/NE-6: Any six leads the department's international engagement for civil nuclear energy participating in the analysis development coordination and implementation of US civil nuclear energy policy.

344

01:17:34.380 --> 01:17:44.940

Jac Goodman - DOE/NE-6: We work with the other any any program offices to coordinate DVDs bilateral and multilateral civil nuclear research R amp D with countries around the world that have advanced nuclear programs.

345

01:17:45.570 --> 01:17:55.560

Jac Goodman - DOE/NE-6: But we also coordinate technical expertise and support to better inform and barking countries on the safety and security issues that should be considered before developing a civilian nuclear program.

346

01:17:56.310 --> 01:18:06.750

Jac Goodman - DOE/NE-6: Our program any 60 employees the suite of tools, including workshops and other expert based exchanges to engage industry, stakeholders and foreign governments on issue issues such as.

347

01:18:07.110 --> 01:18:16.560

Jac Goodman - DOE/NE-6: Nuclear energy as an integral part of of climate of a climate change and energy security strategy nuclear infrastructure development financing for new nuclear builds.

348

01:18:17.250 --> 01:18:22.740

Jac Goodman - DOE/NE-6: Nuclear safety and multinational cooperation on the back end of the nuclear fuel cycle, including disposal.

349

01:18:23.460 --> 01:18:37.170

Jac Goodman - DOE/NE-6: And he sits also coordinates the office of nuclear energy is financial support and technical expertise to international organizations, including the Nuclear Energy Agency, the international framework for nuclear energy cooperation and the International Atomic Energy Agency.

350

01:18:38.250 --> 01:18:43.770

Jac Goodman - DOE/NE-6: Despite that restrictions that are imposed on international travel and the 2020 2021 period.

351

01:18:44.130 --> 01:18:49.290

Jac Goodman - DOE/NE-6: Our office worked effectively through virtual means to maintain a high level of engagement with our foreign partners.

352

01:18:49.650 --> 01:18:55.530

Jac Goodman - DOE/NE-6: But, but by the start of this year office was looking forward to a return to normalcy in our international work.

353

01:18:55.950 --> 01:19:10.740

Jac Goodman - DOE/NE-6: The coven patent dimmick was and still is, of course, ongoing, but we were eager to a return to in person engagements and, as I will discuss later we were preparing for very crowded schedule of multilateral meetings this fall focused on clean energy and nuclear power next slide please.

354

01:19:12.780 --> 01:19:18.990

Jac Goodman - DOE/NE-6: We were empowered by the by the administration's recognition of nuclear powers contribution to the fight against global climate change.

355

01:19:19.440 --> 01:19:27.510

Jac Goodman - DOE/NE-6: Last year's climate leaders Summit in April of 2021 and the UN Climate Change Conference or COP 26 as it's commonly referred to.

356

01:19:27.840 --> 01:19:38.310

Jac Goodman - DOE/NE-6: In November of last year, so the United States, highlighting nuclear power to a global audience and both top line messaging and conference deliverables announced by energy Secretary Jennifer grant home.

357

01:19:38.610 --> 01:19:42.510

Jac Goodman - DOE/NE-6: And Special Envoy for climate john Kerry and our foreign partners.

358

01:19:42.870 --> 01:19:51.870

Jac Goodman - DOE/NE-6: And, even with the gradually waning limitations on travel, we saw important advances in our efforts to build our close partnerships with wrote both Romania and Poland.

359

01:19:52.230 --> 01:19:58.470

Jac Goodman - DOE/NE-6: And to expand our cooperation with Ukraine, countries with a keen interest in working with you, with US industry next slide please.

360

01:19:59.790 --> 01:20:08.730

Jac Goodman - DOE/NE-6: But even with the intensity of the coven crisis waning, we saw a new crisis quickly emerge with russia's irresponsible and reckless invasion of Ukraine.

361

01:20:09.570 --> 01:20:14.460

Jac Goodman - DOE/NE-6: Which is included unprecedented threats to the safety and security of the country's nuclear power plants.

362

01:20:14.910 --> 01:20:23.280

Jac Goodman - DOE/NE-6: For both DVD any writ large, and any six, specifically the month since have been heavily dominated by the impacts of russia's invasion and ongoing war in Ukraine.

363

01:20:23.970 --> 01:20:28.740

Jac Goodman - DOE/NE-6: Building on the cooperation networks that any six built with Ukraine three years of support.

364

01:20:29.040 --> 01:20:39.180

Jac Goodman - DOE/NE-6: for nuclear safety advancement in that country we work to coordinate supplies of emergency diesel fuel and consumables to these facilities to those facilities that have remained under Ukrainian control.

365

01:20:39.480 --> 01:20:49.140

Jac Goodman - DOE/NE-6: support their ability to safely safely operate, energy security is now twin with addressing global climate change and our top line international messaging on nuclear power.

366

01:20:49.440 --> 01:20:53.070

Jac Goodman - DOE/NE-6: In our engagement strategies, particularly in Central and Eastern Europe.

367

01:20:53.790 --> 01:21:05.040

Jac Goodman - DOE/NE-6: Any six the office nuclear energy, the department's leadership and the broader Interagency has been actively engaged in the end in the you're in Europe at a high level since the beginning of the war in Ukraine.

368

01:21:05.640 --> 01:21:15.120

Jac Goodman - DOE/NE-6: Any six supported deputy secretary of energies Turks participation in the US trade mission to the nuclear trade mission to the US to the Czech Republic in March.

369

01:21:15.690 --> 01:21:21.750

Jac Goodman - DOE/NE-6: And we organized the nuclear energy focus meetings that were held under the Partnership for transatlantic energy cooperation.

370

01:21:22.590 --> 01:21:35.820

Jac Goodman - DOE/NE-6: or P tech in Prague in March of this year, and more recently in Bucharest and may going forward will be working with industry within P tech on supply chain mapping to support countries looking to alternatives to Russia next slide please.

371

01:21:37.230 --> 01:21:47.460

Jac Goodman - DOE/NE-6: The crisis in Ukraine is is having a transformative effect on global energy security with important ramifications for the prospects for nuclear power and US competitiveness in the sector.

372

01:21:48.150 --> 01:21:54.750

Jac Goodman - DOE/NE-6: Russia has demonstrated itself through its actions in in Ukraine to be an unreliable and irresponsible supplier.

373

01:21:55.080 --> 01:22:03.060

Jac Goodman - DOE/NE-6: and energy security concerns are increasingly dominating policymaker discussions on nuclear power and key regions of interest, particularly in Europe.

374

01:22:03.630 --> 01:22:06.750

Jac Goodman - DOE/NE-6: And in the last few months we've seen important policy shifts that could have been.

375

01:22:07.620 --> 01:22:15.690

Jac Goodman - DOE/NE-6: Important broad ramifications, since the conflict began, we have seen Belgium opt to postpone the early shut down to its reactors.

376

01:22:16.020 --> 01:22:26.850

Jac Goodman - DOE/NE-6: The Netherlands has rolled out plans for life extension and new builds even Germany a global leader in the anti nuclear community is now considering delaying the shutdown of its final units.

377

01:22:27.630 --> 01:22:37.710

Jac Goodman - DOE/NE-6: development that would have been unheard of before the current crisis and, most importantly, we are seeing countries and Eastern and Central Europe reevaluating their long standing relationship with brushes nuclear supply chain.

378

01:22:38.400 --> 01:22:50.220

Jac Goodman - DOE/NE-6: early last month we saw the efforts by anti nuclear activists to overturn the inclusion of nuclear energy and the European Union, sustainable energy taxonomy successfully thwarted in the European Parliament.

379

01:22:50.940 --> 01:22:59.190

Jac Goodman - DOE/NE-6: Questions still surround the specifics of the taxonomy implementation, but this is a very positive development for efforts to deploy new reactors in the region.

380

01:22:59.580 --> 01:23:03.810

Jac Goodman - DOE/NE-6: And in the internal European debate on the role of nuclear power, going forward.

381

01:23:04.560 --> 01:23:13.800

Jac Goodman - DOE/NE-6: But the fallout of russia's actions and Ukraine for global prospects for nuclear power may not necessarily be limited to Central, Eastern Europe, countries like Turkey and Bangladesh.

382

01:23:14.070 --> 01:23:25.230

Jac Goodman - DOE/NE-6: which have partnered with Russia on new reactor projects and other embarking countries in Africa and Asia which have been developing relationships with Russia as a nuclear supplier may now be open to us engagement.

383

01:23:25.770 --> 01:23:37.830

Jac Goodman - DOE/NE-6: However, the challenge for the United States, how to take advantage of these opportunities in the face of competition from China, of course, and our other are there non aligned competitors next slide please.

384

01:23:39.360 --> 01:23:48.990

Jac Goodman - DOE/NE-6: So russia's disastrous actions in Ukraine have clearly shifted the strategic situation for us competitiveness in the global market for nuclear nuclear power technologies.

385

01:23:49.470 --> 01:23:56.340

Jac Goodman - DOE/NE-6: And I am pleased to report that daily and the broader us in our agency has been working hard to pivot our international engagement and response.

386

01:23:57.090 --> 01:24:05.310

Jac Goodman - DOE/NE-6: What we continue to hear in our in our conversations with other countries, is that they are ready to work with the United States, but of course there are obstacles.

387

01:24:05.610 --> 01:24:12.870

Jac Goodman - DOE/NE-6: That will need to be overcome, to ensure we can secure US leadership recognizing the need to better integrate industry into our effort.

388

01:24:13.650 --> 01:24:18.480

Jac Goodman - DOE/NE-6: The primary challenge remains the fact that we do not face a level playing field internationally.

389

01:24:19.140 --> 01:24:25.440

Jac Goodman - DOE/NE-6: The nuclear industries and our major competitors, China and Russia, as well as France and the Republic of Korea or state owned.

390

01:24:25.830 --> 01:24:33.570

Jac Goodman - DOE/NE-6: well integrated into the national RD establishment and benefiting from generous state funding these industrial structures allow.

391

01:24:34.080 --> 01:24:45.090

Jac Goodman - DOE/NE-6: National governments provide aggressive project financing and expansive and well integrated whole of government seamless coordination of technical support that we face challenges and matching.

392

01:24:45.570 --> 01:24:54.690

Jac Goodman - DOE/NE-6: We continue to see strong enthusiasm for us technologies and appreciation for unmatched historical experience with operating the largest reactor fleet.

393

01:24:55.260 --> 01:24:59.160

Jac Goodman - DOE/NE-6: and also a positive view of the US Government as a trusted strategic partner.

394

01:24:59.760 --> 01:25:10.920

Jac Goodman - DOE/NE-6: Indeed, our competitors are not securing projects, due to their technical superiority, but rather their ability to deliver an aggressive package of financial workforce development, training and political, economic support.

395

01:25:12.390 --> 01:25:20.550

Jac Goodman - DOE/NE-6: The activities of of any six have shifted significantly in recent years as the US Government has worked to address these disadvantages.

396

01:25:23.520 --> 01:25:25.020

Jac Goodman - DOE/NE-6: i'm sorry, could you go to the next slide.

397

01:25:26.970 --> 01:25:28.350

Jac Goodman - DOE/NE-6: No, no, sorry go back one sorry.

398

01:25:32.070 --> 01:25:38.730

Jac Goodman - DOE/NE-6: So our activities in the office of international nuclear energy policy and corporate cooperation have shifted significantly in recent years.

399

01:25:39.210 --> 01:25:49.650

Jac Goodman - DOE/NE-6: As the US Government has worked to address some of these disadvantages and in doing so, this process has better informed us about what is needed to secure a successful international nuclear power project.

400

01:25:50.250 --> 01:26:01.620

Jac Goodman - DOE/NE-6: Five years ago, you would not have seen our office and engaging with countries interested in deploying use technology in the way that we have been doing through our very close strategic partnerships with Romania and Poland.

401

01:26:02.310 --> 01:26:09.060

Jac Goodman - DOE/NE-6: Our work with both of these countries has demonstrated the importance of building the government to government and industry to industry relations.

402

01:26:09.420 --> 01:26:17.610

Jac Goodman - DOE/NE-6: relationships and the period leading up to the signing of actual contracts, the government government relations relationships that have been facilitated.

403

01:26:18.000 --> 01:26:28.620

Jac Goodman - DOE/NE-6: By our partnerships with terranea and Poland hypocritical for resolving the various political resource and technical problems and challenges that have arisen along the way, and also.

404

01:26:29.520 --> 01:26:45.780

Jac Goodman - DOE/NE-6: for providing the political cover for parties and stakeholders on both sides to help push the dialogue along are working both Poland and Romania has demonstrated the importance of sustained and relationship building that is needed to fill facilitate a new nuclear power partnership.

405

01:26:46.920 --> 01:26:55.320

Jac Goodman - DOE/NE-6: The work starts from the initial bilateral meetings with key foreign foreign counterparts in which both countries identify the areas of interest for working together.

406

01:26:55.650 --> 01:27:03.780

Jac Goodman - DOE/NE-6: It has developed further, over time, the negotiation of preliminary cooperation frameworks, like the memorandum of understanding for nuclear cooperation.

407

01:27:04.050 --> 01:27:15.930

Jac Goodman - DOE/NE-6: which we have seen signed with a number of partner countries in recent years, and these confidence building efforts, support the groundwork for the more comprehensive intergovernmental agreements that we've seen with Poland, Romania.

408

01:27:16.890 --> 01:27:24.750

Jac Goodman - DOE/NE-6: are successful work with our Polish and Romanian partners is also helped us to identify the challenges that will need to be addressed going forward.

409

01:27:26.250 --> 01:27:33.900

Jac Goodman - DOE/NE-6: project financing remains the most critical challenge, and in this regard, we remain at a disadvantage or advantage to our competitors.

410

01:27:34.350 --> 01:27:44.220

Jac Goodman - DOE/NE-6: We need to expand the financing mechanisms currently available to the US Government to allow us to better leverage private lender financing for international nuclear power projects.

411

01:27:45.900 --> 01:27:56.370

Jac Goodman - DOE/NE-6: Just because of country has an operator operating nuclear power plant, does not mean it has the personnel and legal regulatory and organizational infrastructure in place to support an expansion.

412

01:27:57.270 --> 01:28:02.520

Jac Goodman - DOE/NE-6: or a new a new reactor project, this was a key lesson that has come out of our engagement with Romania.

413

01:28:03.000 --> 01:28:12.240

Jac Goodman - DOE/NE-6: This is an expanding country where we have seen as much need for technical support and infrastructure financing as Poland and embarking country pursuing an entirely new Program.

414

01:28:13.020 --> 01:28:21.570

Jac Goodman - DOE/NE-6: Multiple US agencies and offices, including any six provide funding and technical expertise for nuclear infrastructure development with partner countries.

415

01:28:21.930 --> 01:28:27.120

Jac Goodman - DOE/NE-6: In recent years, important efforts have been made to enhance support in this area across the entire agency.

416

01:28:27.480 --> 01:28:37.440

Jac Goodman - DOE/NE-6: Including the launch of the State department's foundational infrastructure for the responsible use of SMS technology or first initiative and the inner cities international regulatory support.

417

01:28:38.010 --> 01:28:45.450

Jac Goodman - DOE/NE-6: But this is an area where US government collaboration and cooperation should and can be enhanced and would benefit from additional financial and human resources.

418

01:28:46.470 --> 01:28:53.400

Jac Goodman - DOE/NE-6: Our competitors have the advantage of being able to provide an all in one package of financing technical support and supply chain.

419

01:28:53.850 --> 01:28:58.890

Jac Goodman - DOE/NE-6: This reflects their governments full ownership and integration of their entire nuclear energy establishment.

420

01:28:59.220 --> 01:29:06.810

Jac Goodman - DOE/NE-6: Including RD front and back end right reactor designs fly manufacturing and training and infrastructure development programs.

421

01:29:07.200 --> 01:29:17.580

Jac Goodman - DOE/NE-6: offsetting this advantage will require a concerted effort by both the US government and industry to emphasize and demonstrate the strength and advantages of working with the US as a technology provider.

422

01:29:18.480 --> 01:29:24.480

Jac Goodman - DOE/NE-6: Our work with Poland and Romania and other regions has demonstrated the importance of long term relationship building.

423

01:29:24.840 --> 01:29:32.310

Jac Goodman - DOE/NE-6: Which is requires a significant investment of time and effort by both US government and industry in this regard.

424

01:29:32.880 --> 01:29:44.760

Jac Goodman - DOE/NE-6: Our industry needs some coaching in this area as they're used to a more transactional way of doing business, which is not always translated countries were long period of relationship building are needed to do business.

425

01:29:45.210 --> 01:29:53.460

Jac Goodman - DOE/NE-6: Ultimately, in our own closest partnerships, we find that we have to serve in different roles serving as advisors, to the country on building relationships with suppliers.

426

01:29:53.790 --> 01:30:10.050

Jac Goodman - DOE/NE-6: facilitating cooperation on regulatory development and support and other unexpected requests for technical assistance regarding regardless, the type of relationship building that is required from both industry and government to offset these challenges, requires considerable resources.

427

01:30:11.910 --> 01:30:24.210

Jac Goodman - DOE/NE-6: Adequate protection against potential nuclear liability claims is an essential element of every civil nuclear energy project, and many of us Nuclear Suppliers and investors will not participate in new international markets, without such protection.

428

01:30:24.690 --> 01:30:36.000

Jac Goodman - DOE/NE-6: The Convention on supplementary compensation for nuclear damage the CFC is the only liability Convention, in which the United States as a Member and we must continue to advocate for more countries to join.

429

01:30:36.600 --> 01:30:43.170

Jac Goodman - DOE/NE-6: Encouraging additional countries to join the CSC and promoting nuclear liability as a key issue for international engagement.

430

01:30:43.680 --> 01:30:48.420

Jac Goodman - DOE/NE-6: must be and will be an important focus for any six and the broader usg going forward.

431

01:30:49.200 --> 01:31:01.620

Jac Goodman - DOE/NE-6: nuclear liability has long been a challenge for us industry cooperation with India, even with the country's exception to the CSC and any six has been working to overcome the remaining obstacles towards realizing the cold water project next slide.

432

01:31:03.960 --> 01:31:12.780

Jac Goodman - DOE/NE-6: Looking at the obstacles we still need to overcome i'm happy to report that any and specifically any six has never worked more closely with our inner agency partners.

433

01:31:13.170 --> 01:31:16.980

Jac Goodman - DOE/NE-6: Although there are points of disagreement our communication interactions with our.

434

01:31:17.310 --> 01:31:24.060

Jac Goodman - DOE/NE-6: With our partners within the Department of Energy, including the national nuclear security, administration and the office of international affairs.

435

01:31:24.420 --> 01:31:34.050

Jac Goodman - DOE/NE-6: As well as the broader team USA, including the state and commerce department's the US trade development administration and the nuclear regulatory Commission have continued to be constructive.

436

01:31:34.500 --> 01:31:42.300

Jac Goodman - DOE/NE-6: Most importantly, all of the key agencies and stakeholders are on the same page on the need to support us global leadership on nuclear power.

437

01:31:42.810 --> 01:31:58.500

Jac Goodman - DOE/NE-6: That said, we are working with D we leadership the any front office and the broader inter agency in several key areas, we are working to encourage our export credit agencies to ensure they maximize the use of all of their current authorities to support us nuclear power projects brought.

438

01:31:59.550 --> 01:32:07.920

Jac Goodman - DOE/NE-6: In cooperation with our partners in the state's office of Defense nuclear non proliferation, we are also working with the Agency.

439

01:32:08.220 --> 01:32:15.300

Jac Goodman - DOE/NE-6: To ensure that the appropriate agreements and mechanisms are in place in a timely manner, so that we can be ready to engage key markets.

440

01:32:15.780 --> 01:32:21.570

Jac Goodman - DOE/NE-6: Finally, we are recognizing that there are important opportunities for exploring how we can work better with partners like Japan.

441

01:32:21.930 --> 01:32:31.590

Jac Goodman - DOE/NE-6: And how we can overcome the obstacles to partnering partnering, where appropriate, with our non aligned competitors, France and the Republic of Korea and third markets next slide please.

442

01:32:33.090 --> 01:32:41.010

Jac Goodman - DOE/NE-6: Another important focus area for us going forward will be to identify how best to leverage multilateral engagement to address cross cutting issues.

443

01:32:41.970 --> 01:32:48.330

Jac Goodman - DOE/NE-6: leverage our limited resources and maximize our ability to impact particular regions or country groupings.

444

01:32:48.750 --> 01:32:55.410

Jac Goodman - DOE/NE-6: This includes working with international organizations, where we are key funding contributors, like the IAEA and the Nea.

445

01:32:55.740 --> 01:33:02.880

Jac Goodman - DOE/NE-6: and others like if neck and the generation for international forum with autism nuclear energy holds key leadership positions.

446

01:33:03.300 --> 01:33:12.930

Jac Goodman - DOE/NE-6: For instance, as I noted earlier, we are already engaging our partners and Central and Eastern Europe through P tech on ensuring viable alternatives to secure the nuclear supply chain in the region.

447

01:33:13.680 --> 01:33:22.440

Jac Goodman - DOE/NE-6: One area where multilateral organizations can serve as an important partner for the US Government isn't communicating the advantages of nuclear power, we often see our.

448

01:33:22.740 --> 01:33:27.060

Jac Goodman - DOE/NE-6: foreign partners requesting support in the areas of public messaging and stakeholder engagement.

449

01:33:27.390 --> 01:33:39.720

Jac Goodman - DOE/NE-6: And so we see this area as an important point of overlap with our bilateral and much multilateral engagements and a place where international organizations can have a significant multiplier effect for our efforts next slide please.

450

01:33:41.190 --> 01:33:47.280

Jac Goodman - DOE/NE-6: As i've already stressed US industry main remains a crucial crucial partner international engagement efforts.

451

01:33:47.820 --> 01:33:51.270

Jac Goodman - DOE/NE-6: With our Internet Interagency colleagues, we have been working to improve.

452

01:33:51.810 --> 01:34:00.270

Jac Goodman - DOE/NE-6: Dialogue with the full range of US companies via both the industry associations and individually to learn more about their international activities and engagements.

453

01:34:00.750 --> 01:34:07.260

Jac Goodman - DOE/NE-6: As we work to establish new and expanded government to government relationships and cooperation frameworks, it is critical.

454

01:34:07.530 --> 01:34:14.340

Jac Goodman - DOE/NE-6: For us to understand what countries and regions are considered top medium and long term market opportunities for US industry.

455

01:34:14.970 --> 01:34:21.330

Jac Goodman - DOE/NE-6: Fundamentally industry must play a central role as a partner in the US government's international outreach efforts.

456

01:34:21.720 --> 01:34:28.560

Jac Goodman - DOE/NE-6: Government can and must play a crucial role in helping to build the government, the long term government to government ties that are essential.

457

01:34:28.860 --> 01:34:38.160

Jac Goodman - DOE/NE-6: For for nuclear cooperation but companies are in the best position to engage with and inform government and industrial counterpart for counterparts in other countries on.

458

01:34:38.520 --> 01:34:44.790

Jac Goodman - DOE/NE-6: Their own technical capabilities and to support the connections needed to establish a long term supplier relationship.

459

01:34:45.540 --> 01:34:50.190

Jac Goodman - DOE/NE-6: Fortunately, we are finding legislators and Congress from both parties are paying.

460

01:34:50.790 --> 01:34:56.520

Jac Goodman - DOE/NE-6: Close attention to the challenges facing us industry in international markets and against maligned competitors.

461

01:34:56.970 --> 01:35:02.100

Jac Goodman - DOE/NE-6: The Biden administration at the highest levels is also interested in our mission space with the White House.

462

01:35:02.400 --> 01:35:13.530

Jac Goodman - DOE/NE-6: The National Security Council, and the office of science and technology policy keenly interested in enhancing us international leadership and nuclear power, something that preceded russia's invasion of Ukraine next slide please.

463

01:35:15.450 --> 01:35:27.540

Jac Goodman - DOE/NE-6: For any six all of these challenges, represent a huge mountain to climb for small office team, and we will be relying heavily on our partners within and outside of D we to approach to address these challenges this fall.

464

01:35:28.230 --> 01:35:36.960

Jac Goodman - DOE/NE-6: will be particularly taxing as we will see a lineup of high profile clean energy and nuclear focused events that we will be supporting and involved in.

465

01:35:37.350 --> 01:35:51.030

Jac Goodman - DOE/NE-6: And we are working with n D and the US Interagency US government agency to develop a common messaging that will highlight the United States as reliable and responsible supplier of advanced nuclear technologies, a sharp contrast to Russia.

466

01:35:51.930 --> 01:36:01.440

Jac Goodman - DOE/NE-6: The first event up this month is the review conference of the Nuclear Non Proliferation tree, which is going on right now and will run through the end of this month.

467

01:36:01.920 --> 01:36:08.640

Jac Goodman - DOE/NE-6: Notably, the program includes a deal we sponsored side event on nuclear energy and climate change that is taking place this afternoon.

468

01:36:09.210 --> 01:36:21.270

Jac Goodman - DOE/NE-6: And in New York, the event, which includes the participation of Secretary grand home administrator job Ruby will highlight how the NPT framework has facilitated access to peaceful nuclear technology.

469

01:36:21.810 --> 01:36:31.710

Jac Goodman - DOE/NE-6: And how it brings benefits for economic development, energy security and climate change mitigation any six work to secure key speakers from Kenya and the United Arab Emirates, for the.

470

01:36:33.150 --> 01:36:36.270

Jac Goodman - DOE/NE-6: Next, the next month September will see two big gatherings that the.

471

01:36:36.960 --> 01:36:45.180

Jac Goodman - DOE/NE-6: is heavily involved in the first will be the global clean energy Action Forum, which is the combined clean energy ministerial mission innovation meeting.

472

01:36:45.540 --> 01:36:49.680

Jac Goodman - DOE/NE-6: which will be hosted by doing Pittsburgh on September 21 to 23rd.

473

01:36:50.280 --> 01:36:55.050

Jac Goodman - DOE/NE-6: There will be multiple components of this event that will be focused on highlighting nuclear energy benefits.

474

01:36:55.350 --> 01:37:04.860

Jac Goodman - DOE/NE-6: Including a dedicated business form of government, industry Roundtable moderated by IAEA Director General Rafale grossi and US technologies exhibitions.

475

01:37:05.430 --> 01:37:16.530

Jac Goodman - DOE/NE-6: The second event will of course be the IAS annual general conference which we, we will welcome at which we will welcome the return of the Department of commerce's US industry program for the first time since.

476

01:37:17.910 --> 01:37:26.670

Jac Goodman - DOE/NE-6: The US Government presence at the gc will also see a US exhibit booth in the Vienna international centers rotunda which will also be a welcome sight after a number of years.

477

01:37:27.300 --> 01:37:40.200

Jac Goodman - DOE/NE-6: Next slide please most important for us in any six and the office of nuclear energy, at the end of October will bring the I I am fifth international Ministerial Conference on nuclear power and the 21st century.

478

01:37:40.530 --> 01:37:52.740

Jac Goodman - DOE/NE-6: which promises to be a key highlights of this year, the nuclear power ministerial will bring energy ministers and senior officials from embarking and expanding countries like to Washington DC to deliver national statements.

479

01:37:53.310 --> 01:38:04.440

Jac Goodman - DOE/NE-6: And to participate in technical panel sessions with us, experts and officials on nuclear power and climate change, creating an enabling environment for nuclear energy, supporting the existing reactor fleet.

480

01:38:04.860 --> 01:38:09.840

Jac Goodman - DOE/NE-6: accelerating the deployment of a dance reactors and supporting an effective regulatory framework.

481

01:38:10.500 --> 01:38:20.430

Jac Goodman - DOE/NE-6: outside of the conference program itself, which will include a dedicated us focus side event the nuclear power ministerial will provide ample opportunities for US government and industry.

482

01:38:20.970 --> 01:38:24.180

Jac Goodman - DOE/NE-6: engagement on the sidelines with foreign counterparts from around the world.

483

01:38:24.810 --> 01:38:37.350

Jac Goodman - DOE/NE-6: Do we played a very critical role in the US government's been to host a conference and follows on, which follows on to previous events in France, China, Russia and the United Arab Emirates, if you go back one slide to the.

484

01:38:38.550 --> 01:38:39.300

Jac Goodman - DOE/NE-6: The schedule.

485

01:38:42.570 --> 01:38:43.020

Things.

486

01:38:46.620 --> 01:38:55.920

Jac Goodman - DOE/NE-6: The nuclear power, Minister will be immediately followed by COP 27 the UN, the next UN Climate Change Conference, which will be held in Sharm el Sheikh Egypt in early November.

487

01:38:56.400 --> 01:39:07.350

Jac Goodman - DOE/NE-6: We are anticipating that with the lowering of coven 19 restrictions, we could see a larger usg delegation this this year, which should help support an even broader focus on nuclear energy over.

488

01:39:07.920 --> 01:39:14.220

Jac Goodman - DOE/NE-6: COMP 26 last year's COPs awesome big nuclear energy deliverables announced by the United States.

489

01:39:14.580 --> 01:39:22.260

Jac Goodman - DOE/NE-6: Including the expansion of our strategic strategic partnership with Romania to include small modular reactors, and we are hoping that we can do even better, this time around.

490

01:39:22.650 --> 01:39:29.670

Jac Goodman - DOE/NE-6: there's going to be a heavy regional focus on Africa, this COMP which has been an important focus for DVDs office of nuclear energy.

491

01:39:30.330 --> 01:39:40.410

Jac Goodman - DOE/NE-6: And finally, we will end the fall with with the first in person Ministerial Conference of the international framework for nuclear energy cooperation since the start of the pandemic and Kenya, the end.

492

01:39:42.240 --> 01:39:50.970

Jac Goodman - DOE/NE-6: Of the end of November, we look so we look forward to reporting out from all of these events, to the neck and the months to come, and to receive me your comments and perspectives and what we can do better.

493

01:39:51.360 --> 01:40:00.180

Jac Goodman - DOE/NE-6: And we also look forward to supporting a new new international Subcommittee, thank you for giving me the opportunity to speak to you today, and I look forward to any questions or comments that you might have thanks.

494

01:40:01.950 --> 01:40:17.730

Live Meeting: Thank you so much jack and we do have about a half hour for questions and discussions after our for presentations but since jack is joining us virtually if anyone any of the neck Members has a specific question now, I think that would maybe be slightly easier.

495

01:40:22.410 --> 01:40:26.910

Live Meeting: Thanks jack you offered them a lot of insights and appreciate your presentation.

496

01:40:28.590 --> 01:40:32.370

Live Meeting: You know, as you reflect on the scope that that you have.

497

01:40:33.420 --> 01:40:35.010

Live Meeting: What does help look like.

498

01:40:38.130 --> 01:40:40.020

Jac Goodman - DOE/NE-6: I think just you know um.

499

01:40:41.400 --> 01:40:49.500

Jac Goodman - DOE/NE-6: I think a lot of it will be working more closely with the Interagency and we've been really building up our relationships with State Department.

500

01:40:50.130 --> 01:40:58.560

Jac Goodman - DOE/NE-6: enhancing our coordination with them, ensuring that we that we're not overlapping with what they're providing to countries and that we're better coordinating.

501

01:41:00.270 --> 01:41:13.350

Jac Goodman - DOE/NE-6: What what we're already providing, but I think there, there will need to be longer term a big focus in the area, particularly of training, providing training to the international international partners, that is something that.

502

01:41:14.880 --> 01:41:18.570

Jac Goodman - DOE/NE-6: Russia and China have done very effectively and expansively bringing.

503

01:41:19.620 --> 01:41:21.660

Jac Goodman - DOE/NE-6: Bringing students to each country.

504

01:41:23.130 --> 01:41:25.770

Jac Goodman - DOE/NE-6: In large numbers with partners countries they're working with.

505

01:41:26.190 --> 01:41:35.670

Jac Goodman - DOE/NE-6: and give them an extensive hands on training that and that only gives them the technical expertise, but build those relationships with the supplier country even stronger.

506

01:41:36.030 --> 01:41:50.400

Jac Goodman - DOE/NE-6: I don't think this is something that the government can certainly can't do it by itself it's something I think that all of the stakeholders need to look at better looking at looking at how industry can play a role as well and building kind of a framework that can support.

507

01:41:52.440 --> 01:41:58.320

Jac Goodman - DOE/NE-6: That kind of infrastructure that we just currently are at a disadvantage against Russia and China.

508

01:42:03.720 --> 01:42:06.750

Live Meeting: You mentioned liability how how.

509

01:42:08.460 --> 01:42:13.260

Live Meeting: How does it compare to our international competition.

510

01:42:15.450 --> 01:42:29.100

Jac Goodman - DOE/NE-6: You know, I think that that's the importance of the the CSC weird, we are not members of the Vienna and Paris Accords on liability and we we are industry definitely needs the framework provided.

511

01:42:29.880 --> 01:42:41.550

Jac Goodman - DOE/NE-6: By the protection that is provided by our membership in the CSC so we have been working to encourage more countries to join, both within and with an outside the existing frameworks.

512

01:42:42.600 --> 01:42:45.330

Jac Goodman - DOE/NE-6: India was a big you know, an important.

513

01:42:46.830 --> 01:42:48.840

Jac Goodman - DOE/NE-6: Development of progress in that area.

514

01:42:50.400 --> 01:42:53.040

Jac Goodman - DOE/NE-6: Even though the problems still remain, but.

515

01:42:54.120 --> 01:43:05.370

Jac Goodman - DOE/NE-6: we're hoping to look at other countries like United Kingdom that might be considering membership as well, now that they're out that you know as a result of their risk withdrawal from the European Union, I think that will be an important focus going forward.

516

01:43:11.250 --> 01:43:21.690

Live Meeting: jack just a quick question I haven't looked at it in a couple of years, but the xm bank raised their authorization level to about 135 billion total authorization CAP.

517

01:43:22.260 --> 01:43:29.430

Live Meeting: A couple of years ago, and I think that authorization has to be recertified in about the same time that we might be looking at.

518

01:43:30.450 --> 01:43:37.950

Live Meeting: starting to look at exporting new technologies in the 2027 2828 timeframe is there any work going on to look at raising that CAP.

519

01:43:38.700 --> 01:43:52.680

Live Meeting: Or, certainly at least keeping it high, because I think right now the they're only about five or $6 billion authorized now through xm right now so question is is our work going on to to raise the CAP and make sure funds are available at least direction.

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01:43:54.390 --> 01:44:00.660

Jac Goodman - DOE/NE-6: We I mean I know we have extensive extensive engagement with xm right now, not not only focused on.

521

01:44:02.100 --> 01:44:10.710

Jac Goodman - DOE/NE-6: On the their ability to provide resources, but also on technical expertise what they need to be able to to consider nuclear power projects.

522

01:44:12.000 --> 01:44:16.260

Jac Goodman - DOE/NE-6: But it's a point of intensive discussion and in their in their agency.

523

01:44:20.130 --> 01:44:27.450

Live Meeting: So I had a follow on to maria's question about international training and a framework, do we have a good.

524

01:44:28.320 --> 01:44:40.200

Live Meeting: handle or a comprehensive summary of what we're doing in that area to see where we could grow, because I know there are a couple of different organizations in our agency organizations that sponsor programs like state has.

525

01:44:40.890 --> 01:44:45.030

Live Meeting: Some programs in cooperation within an essay concerning nuclear security are.

526

01:44:45.540 --> 01:44:48.540

Live Meeting: And they are see has safety, so do we have a picture of.

527

01:44:48.600 --> 01:44:49.410

Live Meeting: What we're doing.

528

01:44:50.970 --> 01:45:08.730

Jac Goodman - DOE/NE-6: We yeah we definitely have an idea, the kind of support we provide what i'm talking about as much more you know it's it's not topically specific that is actually where were you know, China and Russia actually brings in nuclear engineers from come in and trains trains them in country.

529

01:45:09.870 --> 01:45:17.220

Jac Goodman - DOE/NE-6: To support countries like Turkey that they are actually constructing nuclear reactors, for I think this is something that's.

530

01:45:19.440 --> 01:45:27.630

Jac Goodman - DOE/NE-6: That needs to be explored and that would go beyond what is currently being provided by by state in the say and e6.

531

01:45:28.020 --> 01:45:38.280

Live Meeting: Right so specifically I was talking about, I know there are some opportunities, where we have fellowships domestically and international so do we have a good.

532

01:45:38.790 --> 01:45:55.530

Live Meeting: summary of those things that are ongoing, and possibly things that we could expand into partnerships or make more robust is that something that we have a grasp on because I know in a national labs we have people you know groups out so is that capture.

533

01:45:56.550 --> 01:46:04.710

Jac Goodman - DOE/NE-6: No, I, I would say I haven't seen a comprehensive, you know report that would kind of capture all that, and it would definitely be something that might be worthwhile.

534

01:46:05.160 --> 01:46:05.730

Jac Goodman - DOE/NE-6: Right now.

535

01:46:06.600 --> 01:46:24.450

Live Meeting: I would put that out as a recommendation to kind of see what people are doing a call across organizations and then even maybe partnering with some of the commercial groups and seeing what they have, because I know people are doing things but i'm not sure we're having an indication.

536

01:46:25.470 --> 01:46:29.310

Live Meeting: Just to capture that and grow and find out best practices.

537

01:46:31.200 --> 01:46:35.430

Live Meeting: Great Thank you so much we'll go ahead and move on to our next presenter now.

538

01:46:36.840 --> 01:46:39.660

Live Meeting: Dr huff if you'd like to introduce our next one.

539

01:46:40.710 --> 01:46:51.180

Live Meeting: sure we have Deputy Assistant Secretary for our lightwater existing fleet and our advanced reactor fleet deployments Alice company.

540

01:47:03.930 --> 01:47:04.530

See.

541

01:47:09.570 --> 01:47:10.920

Live Meeting: Okay, so that's part of this thing.

542

01:47:13.110 --> 01:47:24.570

Live Meeting: Okay, here we go thanks OK so i'm i'm really glad to talk to you today about the work that we're doing for supporting the existing fleet and also to help.

543

01:47:25.140 --> 01:47:39.570

Live Meeting: Our advanced reactors get to the pipeline so Dr have set the table really nicely for this talk um what I wanted to do is quickly in terms of the programs that we manage is talk about.

544

01:47:40.620 --> 01:47:49.470

Live Meeting: What is within my portfolio we mentioned that the advanced reactor demonstration projects are now going to be managed by the office of clean energy demonstrations.

545

01:47:50.100 --> 01:48:03.090

Live Meeting: But i've got two offices that support the work of our existing fleet and advanced reactors, as well as another office that supports our cross cutting technology that's relevant for both reactors and fuel cycle.

546

01:48:03.690 --> 01:48:09.270

Live Meeting: and also our university support so i'm going to go into all of these areas in a little bit more detail.

547

01:48:09.990 --> 01:48:18.360

Live Meeting: And I don't know whether they'll mag what is with us today, but what I wanted to show bill is he's going to recognize many of these faces from the time that.

548

01:48:18.840 --> 01:48:26.670

Live Meeting: That he used to lead our office we have many new people and also people that used to be young that are now and enrolls of leadership.

549

01:48:26.970 --> 01:48:40.920

Live Meeting: So this is our office of nuclear energy technologies that's led by swivelled shatner and she has two teams, Melissa bates is leading our cross cutting technologies area and then Erica rebel is leading our universities.

550

01:48:42.180 --> 01:48:58.560

Live Meeting: And then we have our office of nuclear reactor deployment, which is being led by allison Han and she has two teams Jason turkeys leading our reactor optimization and modernization team, and you know edmonds is leaving our advanced reactor development team.

551

01:48:59.880 --> 01:49:09.330

Live Meeting: So just back to the key goals of what we're trying to accomplish we've got ambitious goals of achieving 100% clean energy on our grid by 2035.

552

01:49:09.810 --> 01:49:29.400

Live Meeting: And zero carbon emissions by 2050 we know these are these are ambitious, but we also know from many economic studies, as these goals, cannot be accomplished without the firm reliable clean electricity offered by nuclear and katie I did not use the other slide i've got a new one.

553

01:49:30.570 --> 01:49:39.930

Live Meeting: It is really pretty but the key thing here is what we need reactors a variety of sizes operating differently on the grid to not just produce electricity.

554

01:49:40.230 --> 01:49:56.610

Live Meeting: But to also work much more effectively with other sources of generation, and not just providing electricity but producing other economics and economic products and working in other roles to help decarbonize the economy so.

555

01:49:57.870 --> 01:49:58.680

Live Meeting: We have.

556

01:50:04.980 --> 01:50:07.530

Live Meeting: Okay well we're done with our meeting.

557

01:50:09.450 --> 01:50:11.070

Live Meeting: Sorry sorry about that.

558

01:50:12.930 --> 01:50:29.520

Live Meeting: um so i'll just keep talking but, but we have large plants and small modular reactors that are uniquely size to serve us on the grid, but we also have micro reactors and my micro reactors have unique attributes.

559

01:50:30.390 --> 01:50:36.000

Live Meeting: The lowest cost of electricity is not one of them, but they're going to be well positioned to meet.

560

01:50:36.480 --> 01:50:51.720

Live Meeting: The needs of users and communities where the cost of electricity is very high, so, for example in remote communities, the cost of electricity can be 1600 times higher than the national average and can consume more than 50% of.

561

01:50:52.410 --> 01:51:03.540

Live Meeting: The households economic needs so and Mike reactors are going to operate very differently in terms of security, staffing and.

562

01:51:04.320 --> 01:51:19.140

Live Meeting: And how they operate with regard to semi autonomous autonomous operations, so we have research and development, addressing the key attributes of all of these sizes and i'm going to start with what we're doing for the existing fleet.

563

01:51:20.160 --> 01:51:32.910

Live Meeting: So for our lightwater reactor sustainability program when this was originally stood up, it was it was largely looking at how to have the the basis for materials to support license extensions.

564

01:51:33.210 --> 01:51:42.000

Live Meeting: Because that was seen as the key thing of keeping plants operating, but what we know is that it's the economic sustainability of plants.

565

01:51:43.050 --> 01:51:54.090

Live Meeting: That is causing them to leave the grid so since 2013 we've had 11 plants shut down before their licenses expired and primarily due to economics.

566

01:51:54.540 --> 01:52:08.250

Live Meeting: And so, our lightwater reactor sustainability program has a number of pathways that you can see here, but what i'm going to cover is some key ways that these programs are currently having an impact on the existing fleet.

567

01:52:08.940 --> 01:52:22.290

Live Meeting: So the first one that I wanted to cover is our integrated operations for nuclear Ion program and, unlike a lot of competing industries, the nuclear sector has not modernized.

568

01:52:23.640 --> 01:52:41.130

Live Meeting: to the same extent and currently relies on a Labor centric business model, and so our program is developing a novel and more efficient model of operation for the nuclear fleet that's going to be supported by the application of digital information and communication technology.

569

01:52:42.150 --> 01:52:53.850

Live Meeting: And this approach is based on the proven transformation of methods that were demonstrated in the North Sea oil and gas industry which that industry.

570

01:52:54.600 --> 01:53:07.530

Live Meeting: was able to transform at a time that they were being threatened by low natural gas prices and high Labor costs relative to their peers and so using that as an example.

571

01:53:08.010 --> 01:53:20.880

Live Meeting: We are developing a business case analysis that's based on a generic to plan to unit plan and this what what we anticipate is by implementing similar methods.

572

01:53:21.930 --> 01:53:30.720

Live Meeting: that we can achieve a reduction operations and maintenance costs of one third that that that kind of reduction is achievable.

573

01:53:31.380 --> 01:53:48.360

Live Meeting: So, right now, our program is working on the technical innovations necessary to implement this model and to achieve these cost reductions and the next phase, would be a full scale pilot demonstrating the effectiveness of these modernization approaches with xcel energy.

574

01:53:49.530 --> 01:53:56.400

Live Meeting: And i'll and i'll mention is I go through a lot of our research programs, a lot of our research begins with our national labs.

575

01:53:56.850 --> 01:54:05.700

Live Meeting: But because we are a highly regulated industry, the way that our research has impact is by piloting these methods with industry.

576

01:54:06.270 --> 01:54:19.230

Live Meeting: in close coordination with our nuclear regulator and you're going to see that as as I cover a lot of our programs that we we try to get out of the labs and into pilots with industry where they can have an impact on our climate.

577

01:54:21.000 --> 01:54:27.660

Live Meeting: So the next one that I wanted to cover is our nuclear safety system digital upgrade effort.

578

01:54:28.740 --> 01:54:40.260

Live Meeting: So this project is going to replace an analog safety related instrumentation and control systems at the Limerick generating station, with a new modernized digital control system.

579

01:54:41.310 --> 01:54:49.260

Live Meeting: So this pilot is going to de risk future projects by demonstrating the viability of streamlined approaches to licensing.

580

01:54:50.580 --> 01:55:03.780

Live Meeting: such as using an RCA digital I nc interim staff guidance and part of this demonstration, will be able to prove the business case for future or future digital safety system upgrades and other plants.

581

01:55:05.010 --> 01:55:13.020

Live Meeting: The estimated net present value of benefits of this project or 50 to $80 million over the lifetime of this station.

582

01:55:15.270 --> 01:55:26.910

Live Meeting: And since this project began in 2020 the team undergoing this project is providing publicly available reports on the design concept, the license amendment framework.

583

01:55:27.510 --> 01:55:43.350

Live Meeting: And the business case methodology for other utilities and other sites to use for their own safety system upgrades the current schedule calls for installation of the systems to be completed in 2024 and 2025 for each of the units.

584

01:55:45.690 --> 01:55:58.440

Live Meeting: And then katie teed up our hydrogen demonstration projects we have been working collaboratively with the office of energy efficiency and renewable energy.

585

01:55:58.830 --> 01:56:10.980

Live Meeting: And jointly selecting projects for them that's going to integrate hydrogen production at existing plants using both high and low temperature electrolysis.

586

01:56:11.790 --> 01:56:22.920

Live Meeting: So these systems will their production systems will range from 150 kilowatts electric to 20 megawatts electric diverted from the grid.

587

01:56:23.970 --> 01:56:34.290

Live Meeting: And, by implementing these projects we're helping to break down the technical barriers and address the regulatory processes for integrating electrolysis with nuclear plants.

588

01:56:35.250 --> 01:56:47.460

Live Meeting: And constellations low temperature electrolysis project at nine nine mile point hopes to be producing hydrogen later this year and the others are expected to follow and.

589

01:56:52.170 --> 01:56:55.170

Live Meeting: Next, I wanted to cover what we're doing for.

590

01:56:56.520 --> 01:57:00.090

Live Meeting: Helping to optimize the use of nuclear fuel.

591

01:57:01.680 --> 01:57:16.530

Live Meeting: optum optimizing the poor leader core reload process and configuration of fuel assemblies and the core has the potential of reducing fuel and fuel reload costs which currently accounts for 20% of the operating costs of most nuclear plants.

592

01:57:17.610 --> 01:57:34.560

Live Meeting: So our work here is developing a new software platform to both optimize this process and evaluate the benefits of accident tolerant fuel and the research has the potential to allow for smaller fuel batch sizes, while producing the same amount of electricity.

593

01:57:35.790 --> 01:57:42.930

Live Meeting: This will reduce fuel costs and also provide significant savings on the back end by reducing the volume of spent fuel.

594

01:57:44.040 --> 01:57:55.350

Live Meeting: And our projects are currently working on muttering these approaches, but we've begun initial engagements with constellation energy for potential application.

595

01:57:57.300 --> 01:58:06.450

Live Meeting: yeah so next um so that's work that we're doing to impact the existing fleet right now i'm going to be covering what we're doing to support advanced reactors.

596

01:58:07.500 --> 01:58:19.740

Live Meeting: And i'll start with our advanced director, research and development at our labs so we've got a we've got research and development programs to support a variety of advanced reactor types.

597

01:58:20.250 --> 01:58:28.830

Live Meeting: And the high temperature gas cool reactor area we are working on try so and graphite qualification, these have been sustained.

598

01:58:29.280 --> 01:58:35.400

Live Meeting: Investments that we've been able to make over the years, to the tune of more than $400 million.

599

01:58:35.820 --> 01:58:46.230

Live Meeting: And we see these investments paying off because we have multiple vendors that are planning to adopt the use of try so fuel, as well as structural graphite.

600

01:58:46.740 --> 01:58:51.270

Live Meeting: And the safety and degree of pedigree I think is illustrated.

601

01:58:51.720 --> 01:59:01.050

Live Meeting: In the fact that Department of Defense when they wanted to choose technologies for supporting their micro reactor demonstration they specifically.

602

01:59:01.320 --> 01:59:10.680

Live Meeting: chose reactors that use try so fuel because of the safety and performance pedigree of the fuel that's been demonstrated so that's being supported within this R amp D Program.

603

01:59:11.430 --> 01:59:18.420

Live Meeting: We have gotten the first of high temperature structural alloy into as me boiling pressure code.

604

01:59:19.200 --> 01:59:26.910

Live Meeting: The first new high temperature reactor to be introduced in 30 years with that sustained investment, we are also able to support.

605

01:59:27.450 --> 01:59:46.890

Live Meeting: Building skilled facilities to develop empirical data to be able to validate performance approaches and codes, so our natural convictions shut down heat removal facility was developed to investigate how air and water circulation can cool advanced reactors.

606

01:59:49.890 --> 01:59:51.960

Live Meeting: In our fast vector research Program.

607

01:59:53.550 --> 02:00:11.790

Live Meeting: Under the atomic energy we we operated many kinds of advanced reactors that we now have commercial developers approaching today, so we have an enormous amount of legacy data that we are working to make available to the commercial community and we've been applying.

608

02:00:13.080 --> 02:00:21.330

Live Meeting: A technical pedigree quality pedigrees to that data so that developers can use that data to engage with a regulator.

609

02:00:22.350 --> 02:00:23.880

Live Meeting: We are also.

610

02:00:25.020 --> 02:00:36.720

Live Meeting: We have them them mechanisms for engineering testing facility or metal, which is a sodium flowing loop facility to be able to test components and prototypical environments.

611

02:00:37.650 --> 02:00:58.410

Live Meeting: And we are also helping to qualify the use of aloe 789 and extend information for that material, so that it can be also updated into the SME code and help direct the use of that material with developers as they approach the licensing cases within our see.

612

02:01:00.330 --> 02:01:06.000

Live Meeting: And then i'm just going to do a quick commercial here, because the secretary of energy did visit argonne national lab.

613

02:01:06.420 --> 02:01:19.800

Live Meeting: Last week, and as part of revisit she was she was there for a ribbon cutting ceremony for the long beam beam line building, which includes the activated materials laboratory that that the office of nuclear energy, supported.

614

02:01:20.310 --> 02:01:34.590

Live Meeting: Under it's an nsf program but while she was there, she also visited a lot of facilities relevant to our office, like the metal test loop that I talked about supported under our fast reactor program as well as.

615

02:01:35.040 --> 02:01:46.170

Live Meeting: The the national can the natural convection shut down here removals facility and she was able to visit a pilot scale electro refining facility and got very excited about.

616

02:01:47.550 --> 02:01:53.910

Live Meeting: The recycling of nuclear material so that was a really well time visit for our Program.

617

02:01:55.560 --> 02:02:02.250

Live Meeting: And then, for our molten salt reactor program a lot of developers need to have more material.

618

02:02:03.960 --> 02:02:19.020

Live Meeting: Fundamental salt properties, to be able to use in their codes and design cases and we're also supporting a number of salt loops and other equipment to help develop the data that they'll need to support their designs.

619

02:02:21.510 --> 02:02:25.710

Live Meeting: For our micro reactor research program, this is a.

620

02:02:27.780 --> 02:02:43.800

Live Meeting: week for micro reactors there's a lot that needs to be understood, about the scale of reactors, and so we have a systems, integration and analysis area that's supporting the economic analysis and feasibility studies for deploying micro reactors.

621

02:02:45.420 --> 02:02:53.070

Live Meeting: We also have a stepwise approach toward being able to demonstrate the attributes of these facilities.

622

02:02:53.520 --> 02:03:10.920

Live Meeting: The first is a single primary heat extraction removal emulator or sphere facilities, which is a separate effects capability to be able to demonstrate the understanding of a single heat pipe and performance.

623

02:03:12.570 --> 02:03:20.580

Live Meeting: That capability is then scaled to our magnet facility or Mike reactor agile non nuclear experimental test bed.

624

02:03:21.600 --> 02:03:35.160

Live Meeting: This is a non nuclear test bed that's able to simulate core thermal behavior primary heat exchanger performance and passive decay heat removal from a heat pipe and gas cold Mike reactors.

625

02:03:35.670 --> 02:03:44.580

Live Meeting: And so, one key milestone for this facility is to be able to run a 37 heat pipe tasks which is planned for later this calendar year.

626

02:03:45.750 --> 02:03:46.530

Live Meeting: And then.

627

02:03:48.810 --> 02:04:03.810

Live Meeting: The next scale a facility that we're pursuing and our Mike reactor program is marble, and this will be a nuclear fueled test bed, that is going to be located in the tree reactor storage pit.

628

02:04:04.560 --> 02:04:15.840

Live Meeting: And this Mike reactor testbed will produce heat and power as part of a test platform to demonstrate Mike reactor operations and and use applications.

629

02:04:16.170 --> 02:04:26.640

Live Meeting: This is being developed in close coordination with industry and there's a lot of excitement about being able to demonstrate capabilities of micro reactors.

630

02:04:27.150 --> 02:04:39.540

Live Meeting: to inform their own designs the the design for this facility is planned for completion this year and we hope to have operations enabled and 2024.

631

02:04:42.780 --> 02:04:47.970

Live Meeting: We are also supporting advanced factors safeguards and security, development.

632

02:04:49.080 --> 02:04:55.350

Live Meeting: This program is addressing the near term challenges that advanced factors face in meeting us.

633

02:04:56.460 --> 02:05:01.770

Live Meeting: Domestic material control and accounting, as well as physical protection systems.

634

02:05:02.520 --> 02:05:13.470

Live Meeting: This program is in close coordination with NRC, which is the regulatory authority for us license designs, but we also work and very close coordination with NSA.

635

02:05:14.010 --> 02:05:27.090

Live Meeting: And their responsibilities for international safeguards, because our developers want to know in safeguards and security by design that they're going to meet the needs for both domestic and international safeguards requirements.

636

02:05:30.240 --> 02:05:32.250

Live Meeting: And then, our advanced directors.

637

02:05:33.360 --> 02:05:45.300

Live Meeting: Regulatory development program we have been working with industry to be able to develop proposed guidance for an RC license application.

638

02:05:46.080 --> 02:05:52.470

Live Meeting: Through the technology inclusive content or applications project and of 40 CAP.

639

02:05:53.130 --> 02:06:08.580

Live Meeting: And this is a kosher project with industry and it builds on previous licensing modernization efforts and at the outcome of this effort, the goal is to have a performance based approach.

640

02:06:09.300 --> 02:06:19.290

Live Meeting: And a structure that is a right size license application that's flexible clear and appropriate for industry applicants planning to use that approach.

641

02:06:20.130 --> 02:06:35.370

Live Meeting: And our advanced venture development program is also supporting targeted research and development to reduce the technical and regulatory risks by providing the bases for establishing licensing technical requirements.

642

02:06:38.880 --> 02:06:39.600

Live Meeting: So.

643

02:06:41.100 --> 02:06:45.600

Live Meeting: Now i'd like to cover what we're doing and cross cutting research and development.

644

02:06:46.350 --> 02:06:59.610

Live Meeting: Our our nuclear energy advanced modeling and simulation or names program is developing the predictive modeling and simulation tools to accelerate advanced reactor deployment.

645

02:06:59.970 --> 02:07:08.310

Live Meeting: As well as improve existing fleet operations, so the tools developed under this program are multi scale and multi physics.

646

02:07:08.910 --> 02:07:22.200

Live Meeting: And we are working again closely with industry and NRC and we see the payoff in these investments and that we have a number of advanced tractor developers choosing to use these tools to guide their designs.

647

02:07:22.590 --> 02:07:29.820

Live Meeting: As well as an RC is adopting the use of many of these tools to to perform their own confirmatory analysis.

648

02:07:31.980 --> 02:07:47.430

Live Meeting: Advanced materials and manufacturing technologies program is pulling together a number of separately budgeted programs on materials discovery data analytics as you build with advanced manufacturing methods.

649

02:07:49.200 --> 02:07:55.320

Live Meeting: To be able to help accelerate the adoption of new materials and advanced reactors.

650

02:07:59.370 --> 02:08:11.700

Live Meeting: Our advanced sensors and instrumentation program many of these advanced designs are being operated and environments, that are not typically supported by currently available advanced sensors.

651

02:08:12.180 --> 02:08:27.270

Live Meeting: And so, these this program is working with a number of our other programs, to ensure that the the techniques and instrumentation can be reliable cost effective and proven and they're designed environments.

652

02:08:30.300 --> 02:08:45.090

Live Meeting: Now we have our nuclear cybersecurity research program, and this is working on developing specific implementation of methods and guidance for advanced nuclear reactors that are under development and.

653

02:08:45.990 --> 02:09:04.710

Live Meeting: We are using these this research, and we hope to demonstrate the use of these techniques, using a representative Mike reactor so marvel will be one example, that we can use to sell to demonstrate the technologies being developed and i'm.

654

02:09:06.480 --> 02:09:07.020

Sorry.

655

02:09:09.180 --> 02:09:15.210

Live Meeting: And then that would in turn provide guidance for cyber security measures and more detailed design.

656

02:09:17.250 --> 02:09:29.370

Live Meeting: Our nuclear science use your facilities programs offers a wide variety of reactors hot cells being lines and analysis to support the study of irradiated materials and fuels.

657

02:09:30.120 --> 02:09:38.040

Live Meeting: This program offers 50 use of facilities that 19 partner institutions around the country as well as when international affiliate.

658

02:09:39.240 --> 02:09:48.000

Live Meeting: Our program also maintains the nuclear fuels and materials library, which makes pedigreed samples available to researchers to support their work.

659

02:09:49.110 --> 02:09:50.940

Live Meeting: at no cost of the researchers.

660

02:09:52.830 --> 02:09:53.370

Live Meeting: So.

661

02:09:54.540 --> 02:10:07.620

Live Meeting: Now what i'd like to do is just to discuss how it is that we directly support industry to leverage the research and capabilities that I was just describing supported in our national labs.

662

02:10:07.980 --> 02:10:20.040

Live Meeting: And so we do this through a number of approaches First is the gateway for accelerated innovation and nuclear which Kemal knows quite well this was stood up and.

663

02:10:22.770 --> 02:10:31.230

Live Meeting: It was recognized that, as we have a nuclear developer Community to be able to have a front door into our 17 national laboratories.

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02:10:31.560 --> 02:10:52.020

Live Meeting: is a real challenge so gain was stood up to help simplify the access to the expertise to capabilities historical data by being a front door and so it's led by I NL in it incorporates the work of a number of national laboratories.

665

02:10:53.790 --> 02:11:00.210

Live Meeting: Through game, we have been providing access to laboratories through vouchers, which has been a very successful.

666

02:11:01.500 --> 02:11:06.480

Live Meeting: approach for making this first partnerships with with industry and our national labs.

667

02:11:08.250 --> 02:11:16.350

Live Meeting: The national reactor innovation Center was supported in fiscal year 20 as part of the advanced tractor demonstration Program.

668

02:11:17.490 --> 02:11:25.350

Live Meeting: Also, let it not Idaho national lab that incorporates the capabilities at a number of national laboratories to provide.

669

02:11:26.910 --> 02:11:35.880

Live Meeting: Support for demonstration of technologies so within and rick we are standing up to test beds, to support nuclear fueled.

670

02:11:37.830 --> 02:11:46.200

Live Meeting: test reactors experimental reactors micro reactors and those test beds are currently being stood up and.

671

02:11:47.340 --> 02:11:55.320

Live Meeting: And rick is also working on an advanced construction technology initiative, we know from a number of.

672

02:11:55.710 --> 02:12:05.940

Live Meeting: Studies that one of the things that has been driving the cost and schedule of new reactor deployments isn't always a nuclear island, but it can be the civil works around it.

673

02:12:06.300 --> 02:12:21.660

Live Meeting: So under the advanced construction technology initiative we are demonstrating more and innovative effective approaches to work, construction and the NRC is very closely following this work, so it can be prepared to.

674

02:12:23.940 --> 02:12:29.850

Live Meeting: Support license applications is that use these technologies from advanced reactor developers.

675

02:12:35.580 --> 02:12:48.210

Live Meeting: Are we, we have a funding opportunity that we called the industry fella this this was stood up five years ago, it has been continuously open and has been a very important vehicle for supporting industry.

676

02:12:49.950 --> 02:13:04.440

Live Meeting: We are in the final year of this industry Fo, but you can see from the number of companies that have benefited these these have often been the the first steps for many of these countries, and we, we see the payoff and.

677

02:13:07.500 --> 02:13:22.890

Live Meeting: And the in the project Fatima described shortly, these have often been the first opportunities to work in a cost your partnership with the government and many of these companies are progressing toward commercial demonstration activities.

678

02:13:25.320 --> 02:13:40.830

Live Meeting: One of them is the carbon free power project, which will be a first demonstration of new scale technology at Idaho national laboratory some new skills earlier awards were through the industry funding opportunity so.

679

02:13:42.180 --> 02:13:51.630

Live Meeting: While this is a demonstration project that is not being transitioned over to the office of clean under you demonstrations, this is supported under a different funding line.

680

02:13:54.150 --> 02:14:05.400

Live Meeting: The goal is to have this capability operational with the first module in 2029, and this is a lightwater reactor cooled small module reactor.

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02:14:05.820 --> 02:14:20.010

Live Meeting: it's going to use air cooling which substantially uses reduces water use and so will be a perfect demonstration of how a small modular reactor can be cited in a much more flexible manner than our large existing plants.

682

02:14:22.950 --> 02:14:43.590

Live Meeting: We have katie teed up our five risk reduction pathway projects to have these are micro reactors which are using our risk reduction awards to help address the cost of just the cost attractiveness of their products, so that they can be ready for commercial demonstrations.

683

02:14:44.640 --> 02:14:51.570

Live Meeting: We do have we're supporting the whole tech like water cooled Snr as well as a first.

684

02:14:52.950 --> 02:15:08.430

Live Meeting: The the the molten chloride fast reactor experiment will be our first operational liquid fueled reactor experiment and many decades, and this this activity will be supported at one of the test beds being stood up under and wreck.

685

02:15:10.260 --> 02:15:17.700

Live Meeting: And again, these are three lower technology designs that are being supported through our 20 awards.

686

02:15:20.340 --> 02:15:32.730

Live Meeting: And then, finally, I want to cover the work that we do and supportive universities, this is our talent pipeline our university support is under a number of competitive research opportunities.

687

02:15:34.560 --> 02:15:53.070

Live Meeting: Since 2009 we've awarded more than 930 $1 million to universities and competitive research and i'm going to predict under Dr huff's leadership we're going to cross the $1 billion threshold very shortly so that will be very fun press release when we get to deliver that to you.

688

02:15:55.260 --> 02:16:05.730

Live Meeting: And so we have competitive university research under the consolidated innovative nuclear research program we also support scientific infrastructure.

689

02:16:06.240 --> 02:16:16.380

Live Meeting: upgrades This includes reactor upgrades for safety and performance at research reactors, as well as enhancing the scientific instrument at the.

690

02:16:17.430 --> 02:16:37.140

Live Meeting: Nuclear engineering departments beginning this year, we have a new distinguished early career program this is fulfilling a need that was sorely needed, and the nuclear area to support early nuclear engineering faculty at had been missing, and this was corrected under Dr huff's leadership.

691

02:16:38.880 --> 02:16:44.040

Live Meeting: And then, our new university nuclear leadership program supports fellowships and scholarships.

692

02:16:45.240 --> 02:17:01.260

Live Meeting: for students pursuing nuclear engineer engineering degrees, and this has been a huge source of talent, not just for our nuclear energy portfolio, but also for our national security portfolio for navy.

693

02:17:02.580 --> 02:17:12.690

Live Meeting: So this so a large number of our PhD students have been have benefited directly from these scholarships.

694

02:17:14.040 --> 02:17:25.410

Live Meeting: And then, our research reactor infrastructure program is providing fresh fuel to our 25 us university reactors at 24 universities.

695

02:17:26.580 --> 02:17:37.560

Live Meeting: We also take that fuel back, and so this has been really important in maintaining the university's the university reactors that we have.

696

02:17:38.400 --> 02:17:54.750

Live Meeting: One recent accomplishment as we restarted a trigger fuel manufacturing capability that supports I think 12 of our trigger reactors, and this is a capability that had been lost since 2012 so this restart was supported from sustained investments from this program.

697

02:17:57.330 --> 02:18:12.240

Live Meeting: And then, finally, what were what you'll see in our fiscal year 23 request and something that we're in the process of formulating is a major revitalize the revitalization to our university infrastructure through.

698

02:18:12.750 --> 02:18:25.710

Live Meeting: A new program that we hope to start that would be a consortium based approach to expand equitable access to education, training and workforce development and our universities.

699

02:18:26.130 --> 02:18:34.590

Live Meeting: And substantially enhance the infrastructure to potentially include one or more micro reactors at universities to serve as research.

700

02:18:35.910 --> 02:18:51.270

Live Meeting: Research instruments, and so we are, we are developing a request for information that we would use to launch this program if it's supported and appropriation, and so we were very closely work watching our our.

701

02:18:52.290 --> 02:19:02.490

Live Meeting: Our fyi 23 marks and we're also very closely watching supporting authorization legislation that's out there to help for this kind of initiative.

702

02:19:04.410 --> 02:19:05.520

Live Meeting: And so i'm.

703

02:19:06.690 --> 02:19:13.920

Live Meeting: to thank you, I knew I knew that was a lot to cover and i'll look forward to supporting your questions we'll get to that point.

704

02:19:18.960 --> 02:19:32.220

Live Meeting: Great Thank you so much Alice so we'll just go ahead and move straight into our next presenter and as Alex mentioned, we do have some time held at the end for questions and discussion prior to lunch.

705

02:19:35.190 --> 02:19:47.250

Live Meeting: Yes, so we have Deputy Assistant Secretary for fuel cycle in the supply chain Andy Griffith who I will know that for many months this year was our acting Assistant Secretary during some of the most chaotic times in our.

706

02:19:47.880 --> 02:19:51.900

Live Meeting: geopolitical space and we're all very grateful to him and his leadership from that time.

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02:19:53.940 --> 02:20:01.050

Live Meeting: Thank you, Dr huff and thanks everyone for being here very important to get me act back up and running.

708

02:20:02.490 --> 02:20:09.360

Live Meeting: Can just say for myself it's been a incredibly important input to our program over the years and i'm glad it's a.

709

02:20:09.840 --> 02:20:24.240

Live Meeting: rejuvenated today with such expertise, as reflected in your introduction this morning before I get into the sides, I would like to introduce a couple of Members in the room, of my leadership team sagar of my deputy the associate Deputy Assistant Secretary.

710

02:20:25.560 --> 02:20:28.770

Live Meeting: sitting behind Sam Britain and then also Stephen con.

711

02:20:30.150 --> 02:20:36.540

Live Meeting: back over and that side of the room, he needs our materials and chemistry technologies.

712

02:20:37.710 --> 02:20:41.970

Live Meeting: area and i'll be talking about those programs so bill McCall he leads are.

713

02:20:43.170 --> 02:20:55.380

Live Meeting: Our fuels area, including the systems analysis group he's on remotely but they all play incredibly important roles and in this program i'm just going to be skimming the surface.

714

02:20:56.430 --> 02:21:04.950

Live Meeting: don't have a lot of time i'm going to be hitting some high points but there's a lot more detail, behind all these slides and the points that I make.

715

02:21:05.340 --> 02:21:17.130

Live Meeting: i'm sure you'll get into them as as you go forward in your role is as a nuclear energy advisory committee, so this is the outline i'll touch base on my overview i'll have my.

716

02:21:18.030 --> 02:21:24.330

Live Meeting: energy system slide up here, which is kind of a thing I do as many presentations I can.

717

02:21:25.080 --> 02:21:38.730

Live Meeting: front end i'm going to cover accident dollar fuel, this is kind of an acronym packed have outlined here but it's accidental or fuel for like water reactors, though, low enriched uranium supply for energy security, which is come into focus, since February 24.

718

02:21:39.750 --> 02:21:48.330

Live Meeting: hi sal you have fuel programmer availability program important for enabling the fleet of advanced reactor deployment.

719

02:21:49.590 --> 02:21:57.120

Live Meeting: The back end technologies i'll get into the recycling area with the APS technologies molten salt technologies and.

720

02:21:57.510 --> 02:22:17.310

Live Meeting: off gas and high performing a robust waste forums and finally i'll touch base on the virtual test reactor and then close with some path forward comments so where we're at with the fuel cycle and supply chain program is we're we're really torn between balancing priorities.

721

02:22:19.380 --> 02:22:20.010

Live Meeting: Before.

722

02:22:22.650 --> 02:22:37.230

Live Meeting: Even before that, when we had about a billion dollar any budget that was primarily going toward R amp D programs primarily at the laboratories, but also with the universities, a little bit of industry engagement.

723

02:22:38.460 --> 02:22:46.080

Live Meeting: Accident tolerant fuel definitely ramped up our engagement with industry on on evolving that fuel forward.

724

02:22:47.280 --> 02:22:58.140

Live Meeting: But then in 20 when we made room and and made the decision to deploy the advanced reactor to focus on advanced reactor demonstration programs and and.

725

02:22:59.940 --> 02:23:12.900

Live Meeting: kind of leading the path for the future that was an important step, and I think that was a necessary step, but what that resulted in is it pulled a lot of money away from R amp D activities, and so what we.

726

02:23:13.470 --> 02:23:23.940

Live Meeting: As we're trying to support both the advanced reactor development program as well as the looking to evolve and improve the the supply chain for the lwr fleet.

727

02:23:24.840 --> 02:23:42.990

Live Meeting: We, we are working to kind of restore that base R amp D load or capability, because that will be really important for us to go in the future, especially as we established the infrastructure, the fuel cycle infrastructure that's going to support the deployment of the advanced reactor technology.

728

02:23:45.180 --> 02:23:52.290

Live Meeting: So this is, this is my picture if you go along the top that, basically, is the open lwr fuel cycle.

729

02:23:54.000 --> 02:24:05.610

Live Meeting: And then, as you introduce us fuel recycling, then you start reusing that material either in a lightwater reactor which we don't do in the US, but France and Japan have done.

730

02:24:06.630 --> 02:24:13.410

Live Meeting: Or you introduce that fuel material as as feed material for advanced reactors and then you go into more recycling.

731

02:24:14.730 --> 02:24:20.100

Live Meeting: This is representative it's not in detail, but it summarizes kind of the the components involved.

732

02:24:21.270 --> 02:24:26.640

Live Meeting: And then of course you've got the safeguard and security by design across the bottom, as well as the systems engineering.

733

02:24:26.910 --> 02:24:38.340

Live Meeting: Our systems, analysis and integration along the bottom as well what's not shown here is the international peace which jack Goodman covered earlier this this morning and that's also a really important element, because.

734

02:24:39.150 --> 02:24:48.960

Live Meeting: This technology is not just domestic it's also global, we need to be mindful of that and there's a lot of like minded democracies out there that we can partner with to.

735

02:24:49.620 --> 02:24:55.470

Live Meeting: improve the deployment of this technology, but the other thing that's not covered on here's the infrastructure piece.

736

02:24:56.430 --> 02:25:03.840

Live Meeting: Alice mentioned the treat reactor or the transient reactor test facility that's an important reactor that has resumed operations recently.

737

02:25:04.320 --> 02:25:15.690

Live Meeting: And incredibly important to our fuel qualification steps also sample preparation lab which is under construction, soon to be in place when that is completed, that will.

738

02:25:16.080 --> 02:25:28.800

Live Meeting: Essentially, put the US as a clear leader in post radiation examination of reality and materials and feels incredibly important facility i'm sure you'll learn more about the infrastructure piece.

739

02:25:29.700 --> 02:25:43.350

Live Meeting: As time goes on, but I just wanted to raise that so the key takeaway here is that, as I said before, the reactor is the workhorse of the nuclear energy system, however, it can't exist alone.

740

02:25:44.880 --> 02:25:50.610

Live Meeting: Clearly there it's interfaces but the front end there's interfaces with the back end and and.

741

02:25:52.500 --> 02:26:02.520

Live Meeting: Recognizing how ultimately the fuel or the waste has to be disposition there's a lot of opportunities to fully optimize this entire energy system.

742

02:26:05.430 --> 02:26:12.240

Live Meeting: So i'll start with the accident powered fuel for like water reactors it really did come about with the events at Fukushima.

743

02:26:13.830 --> 02:26:25.080

Live Meeting: Congress passed some legislation in 2012 that allowed us to go forward with this at the time the lightwater reactor fuel technology has evolved exceptionally well.

744

02:26:26.610 --> 02:26:27.750

Live Meeting: we've gone from.

745

02:26:28.920 --> 02:26:29.220

Live Meeting: A.

746

02:26:30.690 --> 02:26:41.910

Live Meeting: Capacity factors of in the 70s, to back into the 90s fuel failures were at an all time low, and the existing technology got bought as far as it could go.

747

02:26:43.230 --> 02:26:56.730

Live Meeting: But with with the extreme conditions that Fukushima experienced the opportunity came, you know, can we do better, and so the program was born and it's it's really important for the existing fleet to to move it forward.

748

02:26:59.880 --> 02:27:03.840

Live Meeting: This is a slide I shamelessly stolen from any I thank you, Maria.

749

02:27:05.370 --> 02:27:07.140

Live Meeting: And it's presented with their their their.

750

02:27:08.640 --> 02:27:14.430

Live Meeting: allowance good graces, but it really highlights, you know how how this program has evolved.

751

02:27:16.230 --> 02:27:25.500

Live Meeting: The next evolution of improvement to the existing fuel is essentially coded cladding with dope ceramic pellets.

752

02:27:26.760 --> 02:27:29.310

Live Meeting: This This will allow the reactors to.

753

02:27:30.360 --> 02:27:46.230

Live Meeting: Have the the accident tolerance to to survive extreme conditions like Fukushima experienced it will also allow a higher enrichment bumping it up to six 7% enriched you 235.

754

02:27:47.130 --> 02:27:55.500

Live Meeting: And and a higher burn up, which will allow the pressurized water reactors to go from an 18 month cycle to a 24 month cycle.

755

02:27:55.980 --> 02:28:08.280

Live Meeting: Which minimizes the downtime improves the capacity factors and and will help the economics as well, so there's there's a lot of there's a lot of I think positive things here, and this next evolution.

756

02:28:09.210 --> 02:28:18.180

Live Meeting: The program has the objective of deploying batch reloads to this of this technology later this decade.

757

02:28:19.680 --> 02:28:25.410

Live Meeting: But there are still a lot of challenges involved, including sufficient funding to demonstrate.

758

02:28:26.670 --> 02:28:37.740

Live Meeting: industrial production of this fuel and things of that nature, but things are things are progressing well, the the generation or the evolution beyond the cody cladding with dope pellets.

759

02:28:39.900 --> 02:28:45.450

Live Meeting: That involves silicon carbide cladding includes feet cross.

760

02:28:47.100 --> 02:28:49.620

Live Meeting: Steel aluminum chromium.

761

02:28:51.600 --> 02:29:07.500

Live Meeting: type of material and so there's other opportunities beyond this could that could continue to make progress, to perhaps extend the lifetime of the existing fleet of lightwater reactor is even farther than than their dens currently plan.

762

02:29:10.590 --> 02:29:16.350

Live Meeting: Moving on to the uranium strategy to both the low enriched uranium supply and the.

763

02:29:17.550 --> 02:29:29.010

Live Meeting: The high sal you i'll start with with the do we tiger team that was formed and the Secretary designated Dr have to lead this effort, and I have to just say.

764

02:29:29.910 --> 02:29:37.350

Live Meeting: Frankly, that it's been an incredibly powerful teamwork activity with our colleagues in the national nuclear security administration.

765

02:29:38.250 --> 02:29:55.590

Live Meeting: we've been working on the HALO piece for a year or more, but it really expanded when the tiger team was formed, especially in light of the the events of February 24 when the unprovoked war in Ukraine began.

766

02:29:56.790 --> 02:30:03.600

Live Meeting: So the the Department of Energy equities are clearly the the commercial fuel supply for the existing fleet.

767

02:30:04.740 --> 02:30:09.660

Live Meeting: And, as I said, the highest value piece the HALO availability program we call it.

768

02:30:11.130 --> 02:30:14.610

Live Meeting: that's going to enable the deployment of advanced reactors going forward.

769

02:30:16.080 --> 02:30:18.510

Live Meeting: The office of Defense nuclear non proliferation.

770

02:30:19.980 --> 02:30:28.320

Live Meeting: they've got equities and fueling the research reactors that had been converted from HQ production, as well as the medical isotopes in that area.

771

02:30:28.800 --> 02:30:41.550

Live Meeting: And then also they're responsible for the American assured fuel supply, which is about equivalent of six reactor reloads and that was developed from the down blend of heu and historically.

772

02:30:42.630 --> 02:30:52.710

Live Meeting: Also Defense programs, which are on a parallel path to develop their own enrichment technology for Defense needs in the future.

773

02:30:53.400 --> 02:31:04.470

Live Meeting: They need to for the tritium program and the Defense the strategic what strategic weapon stockpile and then Lastly, the naval nuclear propulsion programs that relies on hulu for their.

774

02:31:05.280 --> 02:31:20.430

Live Meeting: naval fleet both submarines and aircraft carriers and that that they are relying on the Defense programs to produce that material for them going forward so this has been a collection i'm not going to get into the details of where we're at Dr have touched on it.

775

02:31:21.480 --> 02:31:26.160

Live Meeting: Earlier we are engaged with the Interagency and the White House.

776

02:31:27.240 --> 02:31:34.080

Live Meeting: gaining a lot of support, I think we've had constructive conversations with Congress, but we still have to bring it to the finish line.

777

02:31:35.850 --> 02:31:41.400

Live Meeting: Focusing on the lightwater reactor they value low enriched uranium for the lightwater reactor fleet.

778

02:31:43.560 --> 02:31:48.210

Live Meeting: As Dr have pointed out, we rely on Russia for 20% of our enriched uranium product.

779

02:31:52.080 --> 02:32:13.590

Live Meeting: Clearly, with the the events in Ukraine, an unreliable source, but also look more globally and there's other sources other countries that want to get into reactor deployment and and fuel those that reactors deployed, and we consider those sources unreliable, so how can we pull in.

780

02:32:15.150 --> 02:32:26.160

Live Meeting: That capacity incentivize additional capacity so that we replace that unreliable capacity that's that's the overarching challenge of the lightwater reactor area of the La area.

781

02:32:28.230 --> 02:32:34.890

Live Meeting: incentivizing new capacity and recognizing that that 20% that the US relies on of.

782

02:32:35.730 --> 02:32:45.570

Live Meeting: Russian uranium is, it would be a big pill to swallow if we were to try to incentivize that solely by the government so we're taking a piece of it.

783

02:32:46.020 --> 02:33:00.090

Live Meeting: Our proposal is to take a piece of that and get things moving in a positive direction expecting that industry and, like minded democracies would join us in the incentive based in incentivizing the.

784

02:33:01.530 --> 02:33:24.690

Live Meeting: nucleus capacity but also looking at our import policies and how could they manage and stabilize that market clearly with Fukushima, the uranium supply to the existing fleet that market has been significantly disrupted by the surplus of uranium left after Fukushima and then with.

785

02:33:25.830 --> 02:33:42.090

Live Meeting: low cost state owned enterprises, making their uranium available is further complicated that so now we're coming out of that we want to take a step in the positive direction get that new capacity, primarily the new capacity up and running and domestically.

786

02:33:43.500 --> 02:33:45.120

Live Meeting: and go forward from there.

787

02:33:47.820 --> 02:33:50.310

Live Meeting: And i'll leave it, I guess, I should say that that.

788

02:33:52.020 --> 02:33:57.570

Live Meeting: In recent years, US mining has gone to essentially zero for uranium.

789

02:33:59.070 --> 02:34:05.910

Live Meeting: However, when we when we do incentivize bringing that back as part of our energy security approach.

790

02:34:07.020 --> 02:34:24.480

Live Meeting: We do want to be mindful of the legacy that that Dr have pointed out earlier from from the mining that was done back in the Manhattan project and the Cold War, the technologies, they are are different and and, in my view, much less impactful.

791

02:34:25.950 --> 02:34:27.720

Live Meeting: But we can't ignore the past.

792

02:34:29.070 --> 02:34:32.640

Live Meeting: Moving on to the highest value area clearly the.

793

02:34:33.750 --> 02:34:35.100

Live Meeting: The stakes are big here.

794

02:34:36.690 --> 02:34:38.460

Live Meeting: you've probably heard the chicken or the egg.

795

02:34:40.380 --> 02:34:46.650

Live Meeting: Investors or interest and advanced reactors is limited because they don't have a fuel supply.

796

02:34:47.940 --> 02:34:50.850

Live Meeting: arm, on the other side of the equation.

797

02:34:51.930 --> 02:35:02.430

Live Meeting: interest or investment in standing up a fuel supply for for customers that don't exist yet is a challenge as well, and so, how do we break this.

798

02:35:03.750 --> 02:35:21.720

Live Meeting: Well, we started a few years ago, we have, we have a demonstration program with a limited capacity that's been established at piped in Ohio we're in the process of competing for the operation, the startup and operation of that facility.

799

02:35:23.250 --> 02:35:26.790

Live Meeting: The the proposals are due on August 22.

800

02:35:27.900 --> 02:35:40.590

Live Meeting: And so we'll we'll go from there, but the the objective really is to stand up that capacity, show that the US technology can produce up to 900 K geez of hi sal you 19.75% enriched.

801

02:35:41.640 --> 02:35:51.900

Live Meeting: per year and that's something that we could potentially build on going forward but we'll have to see, and that that gets into you know fueling the advanced reactors.

802

02:35:53.340 --> 02:36:03.240

Live Meeting: The objective for the for the highest value availability program isn't just to fuel the two demonstrations or the fuel qualification activities.

803

02:36:03.990 --> 02:36:18.000

Live Meeting: that are part of our advanced reactor demonstration program and there you see the family portrait in the lower right hand corner i've got the whole tech lwr technology in there, they don't require haley but everyone else does.

804

02:36:21.150 --> 02:36:33.360

Live Meeting: The two demos, are a start, when you also need to accumulate sufficient quantities of hi sal you so we do risk anybody who orders in advance reactor, subsequent to those two demonstrations.

805

02:36:34.890 --> 02:36:35.370

Live Meeting: Because.

806

02:36:36.540 --> 02:36:42.600

Live Meeting: Operating to demonstration reactors does not success that's not going to achieve our climate objectives.

807

02:36:43.050 --> 02:36:56.250

Live Meeting: deploying those advanced reactor technologies beyond those two demonstrations that's what's going to achieve our climate objectives and our energy security objectives and and that's why this important this program is so important.

808

02:36:57.810 --> 02:37:00.270

Live Meeting: I point out the energy act of 2020.

809

02:37:01.650 --> 02:37:13.290

Live Meeting: It has a broad spectrum of activities you'll learn more about going for and getting deeper into this subject that helps That was a great step in building the foundation of what we're building on today.

810

02:37:14.430 --> 02:37:18.060

Live Meeting: And then the challenges going ahead, you know clearly.

811

02:37:19.980 --> 02:37:25.020

Live Meeting: We do have some material in inventory, that we need to down blend and make available.

812

02:37:26.610 --> 02:37:35.760

Live Meeting: Gaining Congressional support for the big left of establishing a industrial incentivizing and industrial capacity for this is incredibly important.

813

02:37:36.930 --> 02:37:50.760

Live Meeting: National environmental policy, act as if anybody's been involved with me, but before that something that we have to be mindful of, and we need to make sure we complete all the analysis before any major decisions are made, and then we now have to implement.

814

02:37:53.970 --> 02:38:01.110

Live Meeting: Okay, getting back into the the back end of the fuel cycle, and this is important in in the ways I touched on earlier.

815

02:38:03.150 --> 02:38:04.950

Live Meeting: Two things you know one is.

816

02:38:06.150 --> 02:38:11.370

Live Meeting: as stewards of the world, if you will, the environment.

817

02:38:12.990 --> 02:38:29.640

Live Meeting: Reducing the reliance on new mind materials is a benefit, making the best of what materials, you have recovered and you do have available so recovering all that reusable visible material and spend it for fuel or use nuclear fuel.

818

02:38:30.660 --> 02:38:34.800

Live Meeting: It is something that I think is, we should all be mindful of.

819

02:38:36.540 --> 02:38:46.980

Live Meeting: The other aspect of that is keeping that material above ground continuing to produce energy, electricity and applying that energy to are useful purposes.

820

02:38:48.270 --> 02:39:03.930

Live Meeting: and reducing the burden on any future repository These are all good stewardship ideas that I think are important to to keep in mind now this technology is not ready for industrialization I think today.

821

02:39:04.950 --> 02:39:23.970

Live Meeting: Efforts have been made in the past there's a lot of reasons why today might not be a ripe time for it, however, I think we need to keep keep the conversation alive, it has to do with policies driving the economics of the back end of the fuel cycle has to do with technology maturity.

822

02:39:24.990 --> 02:39:35.280

Live Meeting: we're continuing to work on the the accountancy for the material as it's in process so that the safeguards can be done most cost effectively.

823

02:39:37.350 --> 02:39:52.680

Live Meeting: But, but again it's it's so important, we can't lose sight of the the ultimate objective of making the best use of the material that we have so i'll talk a little bit about the aqueous process a little bit about the salt technology and then off gas and and robust face Florence.

824

02:39:53.850 --> 02:40:04.380

Live Meeting: aqueous this is historically been associated with recycling lightwater reactor fuel with the lightwater reactor concepts that are.

825

02:40:05.910 --> 02:40:11.550

Live Meeting: ready for deployment the advanced technologies that are ready for deployment that Dr huff mentioned earlier.

826

02:40:13.440 --> 02:40:23.280

Live Meeting: We need to keep this recycling option available there's been a lot of I think excellent work done, even with rigid reduction in funding.

827

02:40:25.710 --> 02:40:35.070

Live Meeting: To call out the the artificial intelligence and machine learning of applications toward ligand design, which makes the whole separations process more efficient.

828

02:40:35.700 --> 02:40:42.210

Live Meeting: that's really important also call out the vapor extraction of circle and aluminum cladding.

829

02:40:42.780 --> 02:40:51.360

Live Meeting: This technology can pull away a lot of the bulk material early in the process, so that when you're separating the the physical material you're.

830

02:40:51.660 --> 02:41:00.090

Live Meeting: you're dealing with smaller volumes and making that process, a lot more efficient, as well as smaller volumes are easier to pull out the.

831

02:41:00.450 --> 02:41:08.580

Live Meeting: The Non reusable material efficient products that can go into waste and and also it's there's advances in making this a more simplified.

832

02:41:09.330 --> 02:41:22.740

Live Meeting: single step, rather than multiple steps that might recover 99.99% of the material, but then it's substantially increasing the cost, so you know pulling away.

833

02:41:24.270 --> 02:41:32.580

Live Meeting: By far most of the material without getting it almost perfect is is still I think advancement in the in the right direction.

834

02:41:34.620 --> 02:41:49.920

Live Meeting: Moving on to the molten salt technologies and there's a lot of synergies between this activity and the molten salt reactor concepts that are that are being proposed, because they all propose the removal, the online removal efficient products as part of their their approaches on.

835

02:41:51.270 --> 02:41:59.010

Live Meeting: This, this is a been developed over over 30 years it's closely aligned with the sodium fast reactor technology.

836

02:42:00.270 --> 02:42:06.450

Live Meeting: we've made good progress in collaboration with the Republic of Korea as part of the joint fuel cycle study.

837

02:42:07.920 --> 02:42:30.390

Live Meeting: And, and again this this technology has the capability of recovering group back tonight's transatlantic material, as well as uranium and in the fast reactor technology is well suited towards transmitting that material generating electricity, while not expanding the use of the the.

838

02:42:32.430 --> 02:42:38.040

Live Meeting: Creating more material than you need to and that's an important part of recycling too because.

839

02:42:40.020 --> 02:42:55.680

Live Meeting: there's there's been you know historic discussion, you know reprocessing versus recycling Bob reprocessing is really only the first step in recycling recycling comes when you're taking that reusable material and putting it back into generating energy.

840

02:42:59.640 --> 02:43:16.620

Live Meeting: Moving on the off gas and and robust waste forums, so, so there are off gases that need to be captured I think there's policy opportunities in the off gas area because right now of the regulation driving that 40 CFR 190.

841

02:43:17.670 --> 02:43:22.950

Live Meeting: requires a high degree of capture for the off gas.

842

02:43:24.330 --> 02:43:33.210

Live Meeting: there's I think debate on how much of that's actually hazardous, because when you go back and look at how that regulation took place, it was at the.

843

02:43:33.870 --> 02:43:47.970

Live Meeting: tail end of barnwell and West valley and the input for that regulation was very limited and it's it's not very I would say, scientifically based so there's clearly some some opportunities there.

844

02:43:49.440 --> 02:43:58.740

Live Meeting: However, we are developing this technology it's it's making I think really good progress, a lot of collaboration with our international partners, in some cases.

845

02:43:59.340 --> 02:44:12.600

Live Meeting: And then on the road, a robust voice form again if if we can capture what waste materials result from recycling, so that they can withstand centuries of.

846

02:44:14.070 --> 02:44:19.500

Live Meeting: Isolation in in various genealogies it's going to make the whole energy system better.

847

02:44:21.540 --> 02:44:24.360

Live Meeting: Last point of content here, I will.

848

02:44:25.470 --> 02:44:33.060

Live Meeting: comment on is the versatile test reactor, unfortunately we have not been successful in gaining Congressional support for funding this.

849

02:44:33.990 --> 02:44:43.170

Live Meeting: It was not included in the fiscal year 22 appropriations and it's not currently in either the House or the Senate mark there's still.

850

02:44:43.590 --> 02:44:55.140

Live Meeting: A glimmer of hope left that it might emerge out of conference but we'll never know we'll find out when when we get there, but let me just comment that this this project has made incredible progress.

851

02:44:56.040 --> 02:45:06.210

Live Meeting: Even given that limited funding over the past several years, I mean come on was the program director, so you know no comment from Kemal you're not exactly objective but.

852

02:45:07.470 --> 02:45:19.920

Live Meeting: But but but know that the team has performed phenomenally it chief critical decision one they built a solid path or fueling this reactor.

853

02:45:20.610 --> 02:45:38.550

Live Meeting: Which is, which is similar to the Atrium concept only where an Atrium concept is a heat generating electricity generating energy generating machine, this is a very consolidated neutron generating machine for testing for fast neutron fast spectrum nutrient testing.

854

02:45:40.200 --> 02:45:49.020

Live Meeting: Using a different variant of the same prism based design and and the progress they've made has just been phenomenal, unfortunately.

855

02:45:49.590 --> 02:45:55.350

Live Meeting: The priorities of the RDP and the other reactors have taken precedent we acknowledge that.

856

02:45:56.250 --> 02:46:11.340

Live Meeting: We hope that at some point in time, the funding will resume for this, that it can pick up and carry on, but it, but it ended, I think, on a very positive note, just recently with the issuance of the record of decision from that nepa process for this reactor, which is the first.

857

02:46:12.720 --> 02:46:22.500

Live Meeting: deal we reactor to undergo the nepa evaluation all the previous reactors were grandfathered in when nepa was established so that's a huge accomplishment.

858

02:46:23.730 --> 02:46:32.310

Live Meeting: That decision Bade was that the vtr will be located in Idaho national over at Idaho national laboratory.

859

02:46:32.820 --> 02:46:44.970

Live Meeting: Fuel fabrication options evaluated two different sites one in Idaho and one in savannah river that still pending the ride did not include that but that'd be subject to future evaluation.

860

02:46:45.480 --> 02:46:54.900

Live Meeting: On the activities that could be carried on at some level of funding were provided for this would would deal with the risk reduction activities of.

861

02:46:55.800 --> 02:47:09.690

Live Meeting: Dealing with some of the critical components of the reactor, it would allow the reactor to stay closely in touch with the Atrium project so that benefit, it would benefit from the lessons learned from the Atrium design maturation.

862

02:47:11.280 --> 02:47:25.530

Live Meeting: And, and also the the fuel for this reactor is a plutonium, uranium circle a Halloween fuel and so they would be able to work with the NSA to better define how the the.

863

02:47:26.040 --> 02:47:38.670

Live Meeting: plutonium fuel feed material would go from the surplus inventories into fuel fabrication for this project, so those those are kind of the summary things that could be carried on if there was some level of funding.

864

02:47:39.420 --> 02:47:45.150

Live Meeting: But we'll just have to stay tuned there and and hope that something materializes with the conference bill.

865

02:47:46.230 --> 02:47:46.770

Live Meeting: or later.

866

02:47:48.120 --> 02:47:53.310

Live Meeting: But, but in the meantime it's it's going on a kind of a standby they're there.

867

02:47:54.450 --> 02:48:00.390

Live Meeting: they're completing everything and putting in a state, so it can be resumed at some point in the future, so the path forward.

868

02:48:00.900 --> 02:48:10.890

Live Meeting: I talked about the balance between supporting the deployment of advanced reactors and supporting the existing existing fleet, but still restoring the the base R amp D activities that are going to.

869

02:48:11.400 --> 02:48:17.040

Live Meeting: continue our leadership and innovation going forward on the in the fuel cycle area.

870

02:48:18.030 --> 02:48:32.340

Live Meeting: Continue the partnership with industry, universities and our international partners it's incredibly important to to leverage what we do with information and collaboration that comes from our partners are.

871

02:48:34.050 --> 02:48:47.190

Live Meeting: supplying the fuel for the existing fleet and the advanced reactors if we don't get it right it's it's just going to make the future, a lot more difficult, and the last point is that the fuel cycle is really important.

872

02:48:49.470 --> 02:48:51.090

Live Meeting: We need the advanced reactors.

873

02:48:52.290 --> 02:48:59.430

Live Meeting: But we need the fuel cycle that supports their deployment if we don't get the fuel cycle right their growth will be stunted and so.

874

02:49:00.030 --> 02:49:09.000

Live Meeting: We can't lose sight of that we have to try to communicate that with with others as well with that I look forward to questions later.

875

02:49:09.960 --> 02:49:18.750

Live Meeting: Great Thank you so much Andy yes, as you mentioned, we will have time for questions later and for folks following along on the timeline.

876

02:49:19.260 --> 02:49:27.030

Live Meeting: While it appears were a little bit behind schedule, we aren't really because we took those questions from jack so he could depart on.

877

02:49:27.510 --> 02:49:37.980

Live Meeting: His tour over in oakridge so now i'll turn it over to katie to introduce our next speaker and, of course, for spent fuel and high level waste management, we have.

878

02:49:38.550 --> 02:49:54.960

Live Meeting: Our most recent Deputy Assistant Secretary higher Sam Britain who will be presenting on all the many initiatives that we have for restarting our cleaner and more focused efforts towards progressing spent nuclear fuel management overview Sam.

879

02:49:57.630 --> 02:50:07.050

Live Meeting: Hello everyone, as we said, my name is TIM brinson my pronouns are they and them and I serve as our Deputy Assistant Secretary for spent fuel and waste disposition.

880

02:50:07.860 --> 02:50:20.280

Live Meeting: As it has only been a few weeks on the job I do apologize, as I will be reading some of my remarks to make sure that I stay on schedule and appropriate, but, as you have questions i'll be happy to answer them as well let's get started.

881

02:50:21.510 --> 02:50:23.340

Live Meeting: Since I had to memorize the.

882

02:50:25.080 --> 02:50:28.740

Live Meeting: worksheet I felt like you should all know it too so here's where we actually relate.

883

02:50:29.280 --> 02:50:40.110

Live Meeting: into this system so as we've already had an introduction by Dr huff we begin, we do have a series of advanced reactor work, as was mentioned by Alice.

884

02:50:40.500 --> 02:50:47.940

Live Meeting: The advanced fuel cycle work, obviously, mentioned by Andy and then there at the end you see any eight which is my office.

885

02:50:48.390 --> 02:50:57.900

Live Meeting: Now my office is responsible for the research and development, related to the long term disposition of spent nuclear fuel storage and, of course, its associated transportation.

886

02:50:58.260 --> 02:51:08.310

Live Meeting: Our mission is simple develop implement an integrated system to sustain it sustainably and responsibly manage the nation spent nuclear fuel and high level radioactive waste.

887

02:51:08.730 --> 02:51:24.840

Live Meeting: We of course work with each and every one of you national labs academia and industry to achieve this mission and, as you can see, there are subdivisions of our work, one more responsible for the research and development, and the other responsible for that implementation.

888

02:51:26.460 --> 02:51:34.920

Live Meeting: The as we've been talking today we've discussed a variety of different issues related to deploying nuclear energy as the solution or.

889

02:51:35.490 --> 02:51:44.400

Live Meeting: The carbonation decarbonisation but increasing that access to energy is going to also require progress on the management of spent nuclear fuel.

890

02:51:44.910 --> 02:51:47.400

Live Meeting: In action on this issue has cost taxpayers.

891

02:51:48.330 --> 02:51:58.320

Live Meeting: Nearly $9 billion with settlements and judgments and while it is safely stored across the country the communities that have spent nuclear fuel never agreed.

892

02:51:58.530 --> 02:52:06.990

Live Meeting: to host that material long term, so we cannot continue to defer this problem for future generations intergenerational equity is key.

893

02:52:07.680 --> 02:52:22.500

Live Meeting: Management of the nation's spent nuclear fuel is the responsibility of the Department of Energy and it is our responsibility to those communities to move the spent nuclear fuel to our interim storage facility and that time has to begin now.

894

02:52:23.130 --> 02:52:35.190

Live Meeting: we're working to develop a comprehensive spent nuclear fuel strategy that will address the spent nuclear fuel and the high level waste and this system will include transportation storage disposal.

895

02:52:35.700 --> 02:52:49.170

Live Meeting: In order to sustainably and responsibly manage this we're going to need to site both an interim storage facility and permanent disposal facilities and we need help and identifying those willing and informed host communities to be our partners.

896

02:52:51.000 --> 02:53:05.040

Live Meeting: Consistent with direction from Congress and funding the department is not actively pursuing a repository site, we do expect to dispose of spent nuclear fuel in a repository in the future, we are the US.

897

02:53:05.400 --> 02:53:16.080

Live Meeting: Conducting high level research and development for eventual geologic disposal, and that includes a variety of different ideologies include, as well as increasing the confidence.

898

02:53:16.320 --> 02:53:23.340

Live Meeting: In the robustness of our disposal concepts, so that when those those concepts are placed out the communities can trust them.

899

02:53:23.820 --> 02:53:26.250

Live Meeting: As you've already heard from my colleagues Alice.

900

02:53:26.580 --> 02:53:35.640

Live Meeting: And Andy advanced reactors are on the way and we need to be ready for advanced nuclear waste so accident, tolerant and advanced fuels are being analyzed.

901

02:53:35.880 --> 02:53:50.490

Live Meeting: To understand what's going to be needed in their disposal, and in a geological repository as well as how to integrate them into an integrated waste management system we are recognizing that we're going to conduct extended storage.

902

02:53:51.540 --> 02:53:56.130

Live Meeting: Research and development aging management and, of course, transportation research.

903

02:53:57.000 --> 02:54:05.790

Live Meeting: In all of this effort, we are leveraging our international collaboration and I want to highlight a little bit of that work for us for here before we get into the next stages.

904

02:54:06.750 --> 02:54:13.800

Live Meeting: We are doing a variety of international collaboration when it comes to nuclear waste management, this is spanning from.

905

02:54:14.190 --> 02:54:22.320

Live Meeting: IAEA activities with Joint Convention on the Safety of Spent fuel and Safety of Radioactive Waste management which my colleagues just returned.

906

02:54:22.890 --> 02:54:35.670

Live Meeting: From as well as joining with the NRC in our radioactive waste management committee at the OECD and Nea and of course we are an active member of.

907

02:54:36.360 --> 02:54:44.760

Live Meeting: The International Association for the environmentally safe disposal of radioactive materials, this is an association of executives and chairs.

908

02:54:45.180 --> 02:54:52.980

Live Meeting: Just like me a worldwide radioactive waste management organizations, most importantly, we recognize that these engagements are going to help us.

909

02:54:53.220 --> 02:55:06.660

Live Meeting: participate in information exchange with these countries, knowing the best practices and hope but identifying areas for joint research and development, so we participate in a variety of R amp D projects, including bilateral.

910

02:55:07.890 --> 02:55:16.200

Live Meeting: collaborations, for example, one of my new favorite is our work with Germany on salt rock specifically so.

911

02:55:17.070 --> 02:55:26.580

Live Meeting: In all of this work, I want to try to capture a little bit of the international collaboration that we're doing in the different types of mediums so through collaborative agreements.

912

02:55:26.820 --> 02:55:37.020

Live Meeting: We are obtaining data from a variety of experiments data should be shared and making sure that we are reaching out and learning from those around us is critical.

913

02:55:37.290 --> 02:55:44.760

Live Meeting: we're taking the lead in designing some of these experiments as well as benefiting from the others who will actually.

914

02:55:45.750 --> 02:55:54.030

Live Meeting: Do the experiment in their undergrad and research labs so, for example, the US has led an experiment called hot bent for bentonite.

915

02:55:54.540 --> 02:56:09.300

Live Meeting: project at the crimson test site in Switzerland this experiment is focused on better understanding those clay buffers and near rock performances at high temperatures so three heaters turned on in 2021 and it will run for 20 years.

916

02:56:09.750 --> 02:56:15.780

Live Meeting: Over 200 degrees Celsius compared to our typical 100 degrees Celsius Celsius temperature range.

917

02:56:16.260 --> 02:56:29.310

Live Meeting: This is going to allow us to better understand the different geologic media and validate our models it's important to mention that we do have our own underground research facility insult rock which is not pictured here.

918

02:56:29.850 --> 02:56:39.210

Live Meeting: But the BATs test they're currently is producing research and data that other countries are seeking specifically on salt media.

919

02:56:40.320 --> 02:56:46.560

Live Meeting: And last but not least, in an international and I will get to my favorite topic in the world can send a sighting.

920

02:56:47.280 --> 02:56:53.700

Live Meeting: we're going to be participating in a variety of international collaboration projects in storage and transportation as well.

921

02:56:54.030 --> 02:57:05.580

Live Meeting: So, for example, pictured here we have the multimodal transportation test, where we used a truck a barge and a train to make sure that we understood how.

922

02:57:06.450 --> 02:57:18.450

Live Meeting: The data could be collected on storage and transportation, excuse me, as we were transporting this cast around There are a variety of other projects, but I will skip them or time.

923

02:57:19.260 --> 02:57:26.640

Live Meeting: Okay, so another important part of our work is the work, focusing on the actual implementation so we talked about the.

924

02:57:27.030 --> 02:57:32.970

Live Meeting: Research and development, but now let's chat about the integrated waste management system as an integrated system.

925

02:57:33.540 --> 02:57:40.170

Live Meeting: So we are doing a variety of different topics first off and what we will cover a little bit later is our consent be sighting.

926

02:57:40.470 --> 02:57:51.480

Live Meeting: Of course that consent be setting requires transportation, to a certain site, and so we are working on develop development and plan activities such as rail car development intergovernmental.

927

02:57:52.050 --> 02:58:02.610

Live Meeting: relationship building and training and, of course, existing infrastructure assessment going to the sites where this nuclear waste is currently house to make sure that it is ready for pickup.

928

02:58:03.060 --> 02:58:08.250

Live Meeting: We also conduct a variety of systems analysis you already heard Andy mentioned systems analysis.

929

02:58:08.460 --> 02:58:18.150

Live Meeting: It keeps happening when it gets to spent nuclear fuel, to make sure that we are ready for all the different types of enhanced nuclear waste to come into our system.

930

02:58:18.420 --> 02:58:24.210

Live Meeting: And of course generic design of the facilities that are going to be part of that waste management system.

931

02:58:25.080 --> 02:58:33.330

Live Meeting: We are making sure yeah we are committed to a consent based approach to citing that enables broad participation.

932

02:58:33.510 --> 02:58:45.630

Live Meeting: And setters equity and environmental justice consent by setting is an approach to citing that meets the needs of the Communities and the people we are serving Central to that process so.

933

02:58:45.900 --> 02:58:55.410

Live Meeting: communities can elect to participate by working collaboratively through a series of steps and phases, to work with the department, as the implementing organization.

934

02:58:55.920 --> 02:59:04.920

Live Meeting: And each step in faith helps the Community determine whether and how they want to proceed in that meeting those goals of the Community itself.

935

02:59:05.220 --> 02:59:14.640

Live Meeting: So they're intended to serve as a guide, not as a prescriptive set of instructions and we recognize that consent be saying is going to look different in each community.

936

02:59:15.090 --> 02:59:23.400

Live Meeting: So the potential outcomes could include a negotiated consent agreement they could be defined by Community in collaboration with the department.

937

02:59:23.910 --> 02:59:32.370

Live Meeting: or they could determine that they are no longer interested in working with us and on this process that is both a successful outcome.

938

02:59:32.760 --> 02:59:42.990

Live Meeting: And we recognize it's a challenge, but we know that consent be citing is not only the right thing to do is the most likely to have a chance of success so.

939

02:59:43.470 --> 02:59:58.200

Live Meeting: What are we doing on consent based same first off we did recognize that Nick may have a subcommittee on this topic so i'm going to spend a little bit more time highlighting how we have progressed in this issue, but you are free to ask questions as we go further.

940

02:59:59.190 --> 03:00:11.730

Live Meeting: The first step, we did was a request for information we have placed it in December receiving a variety of comments that were going to help guide our process, we did receive some late.

941

03:00:12.210 --> 03:00:19.020

Live Meeting: submissions and accepted them as well, while this rfp was not seeking.

942

03:00:19.560 --> 03:00:27.900

Live Meeting: volunteers to host sites, we did hear from the public on a range of different topics, including of course the content based lighting process itself.

943

03:00:28.200 --> 03:00:37.500

Live Meeting: The removal of barriers to more meaningful participation specifically to the underserved communities that we want to make sure, have a seat at the table and, of course.

944

03:00:37.800 --> 03:00:47.550

Live Meeting: How does interim storage, which we are hoping to site with consent based citing How does that fit as a component of the nation's nuclear waste management system.

945

03:00:48.060 --> 03:01:01.290

Live Meeting: Our special focus for this Roi as as in everything was to focus on equity and environmental justice as the cornerstones of this process and, of course, as the cornerstones of the whole waste management process as a whole.

946

03:01:02.490 --> 03:01:10.380

Live Meeting: We received a lot of comments with 225 submissions they are all posted in their entirety on our website I.

947

03:01:10.650 --> 03:01:27.690

Live Meeting: doubt, many of you have sent the time to read all 1600 pages like I have so i'm going to give you a brief summary of those comments as we're going forward we did hear from a diverse set of commenters, of course, tribal and state and local governments, as well as NGOs.

948

03:01:28.740 --> 03:01:40.740

Live Meeting: Industry academia and private citizens of variety of individuals, told us that consent be setting was important to them and they spent the time to respond to our request for information.

949

03:01:41.310 --> 03:01:55.710

Live Meeting: So what are some of those common feeds common themes or the actual topic of consent be sighting in the rfp responses and again, these are brought in general on a full report on this topic will be coming out, and I will cover that very briefly.

950

03:01:56.430 --> 03:02:08.220

Live Meeting: So there is general support for consent based sighting of facilities, there was a there was in terms of defining what constitutes a community and consent.

951

03:02:09.120 --> 03:02:16.860

Live Meeting: Differentiation with something that do we need to define these terms, while others insisting that that consent should be defined by the communities themselves.

952

03:02:17.160 --> 03:02:24.900

Live Meeting: And the these definitions will vary between each community, so can they actually be one definition of consent based citing.

953

03:02:25.440 --> 03:02:40.650

Live Meeting: We did hear a lot about the need for a fair and transparent process, as well as the need to rebuild trust is clear to us that can consult a setting process needs to be flexible adaptive and inclusive and there needs to be equitable distribution.

954

03:02:41.670 --> 03:02:46.470

Live Meeting: and integrate intergenerational justice as major topics as well.

955

03:02:47.280 --> 03:03:01.830

Live Meeting: Last but not least, we got really helpful suggestions and a whole list of them of what resources communities will need to get that informed consent, including funding for citizen panels and hiring trusted experts to conduct those evaluations.

956

03:03:02.340 --> 03:03:09.330

Live Meeting: When it came to the integrated waste management system, we did hear a series of concerns about how long.

957

03:03:09.720 --> 03:03:17.040

Live Meeting: term storage facility would last and the legality of interim storage under the nuclear waste policy act in the absence of a repository.

958

03:03:17.280 --> 03:03:26.100

Live Meeting: So many commentators stress the need to establish a new, independent organization for nuclear waste management and fix the nuclear waste fund.

959

03:03:26.490 --> 03:03:43.650

Live Meeting: And again, I want to reiterate those comments were just high level overviews and we are analyzing all 1600 pages of those comments as we speak, to make sure that our findings are publicly available and representative of the diverse perspectives that were raised.

960

03:03:44.820 --> 03:03:54.630

Live Meeting: We are using the feedback from the RSI to inform our next steps in the process i'm going to try to cover a variety of things that are all coming out very quickly.

961

03:03:55.980 --> 03:03:58.590

Live Meeting: and which we are working very hard on.

962

03:03:59.040 --> 03:04:11.070

Live Meeting: Word first word sorry, excuse me, we will publish the results of comments analysis that summary of the RSI more than just a slide that you got, we will have a full summary that will be coming out soon.

963

03:04:11.370 --> 03:04:24.840

Live Meeting: we're also further developing the draft and send be setting process that process itself needs to be updated and edited based on the feedback from our Roi and that will also be coming out, I hope that you hold us accountable.

964

03:04:25.500 --> 03:04:38.040

Live Meeting: To get these out to you as soon as possible, and of course we're working on a funding opportunity this is extremely exciting for the interested groups and communities who wants to tell us more about what content looks like.

965

03:04:38.430 --> 03:04:50.820

Live Meeting: This will not be asking for volunteers again it just aims at building capacity and providing the opportunity for stakeholders to learn about the process and, of course, to learn about spent nuclear fuel management.

966

03:04:51.780 --> 03:05:03.240

Live Meeting: Once it is out, I hope you can help us make sure that it reaches as many communities as possible and, last but not least, we are clarifying our broad strategy on integrated waste management.

967

03:05:03.750 --> 03:05:19.800

Live Meeting: As a whole, as you can see that's four major issues all coming out here very, very soon, we are busy bees infant nuclear waste management, and I hope that, again, you see, all of these and you share them widely once they are ready for release.

968

03:05:21.000 --> 03:05:31.440

Live Meeting: um and Oh, I did want to mention that as we're moving forward into this space that we are making sure that our talents in the department getting all of those reports ready.

969

03:05:31.740 --> 03:05:42.540

Live Meeting: are representative of the variety of needs, when it comes to nuclear waste management so, for example, just this week we have hired two social scientists who just started yesterday.

970

03:05:43.470 --> 03:05:59.250

Live Meeting: which I am truly excited to say will help us integrate both the social sciences into our technical science work to address this monumental grand challenge so to briefly summarize, and then we get to do some question and answer I hope it was moderately good on time there.

971

03:06:00.360 --> 03:06:13.950

Live Meeting: We are using a consent be setting approach, we will use it and we will work with communities to identify sites that store the nation spent nuclear fuel we're going to restore public trust and we're going to build competence by opening and.

972

03:06:14.340 --> 03:06:23.130

Live Meeting: Transparent consent based lighting process, I did mention that we are implementing a federal consolidate interim storage capability for right now.

973

03:06:23.610 --> 03:06:31.770

Live Meeting: Consistent with Congressional authorization we're going to conduct generic disposal research and once we've heard from stakeholders that there is.

974

03:06:32.190 --> 03:06:37.320

Live Meeting: a need for a clear pathway for disposal the potential host may be reluctant to host interim storage.

975

03:06:37.920 --> 03:06:44.070

Live Meeting: Due to the potential for becoming a de facto permanent solution so we're going to recognize that challenge and we're going to.

976

03:06:44.910 --> 03:06:51.210

Live Meeting: Make sure that a pathway for disposal is included in our integrated waste management holistic strategy and planning.

977

03:06:51.690 --> 03:06:56.340

Live Meeting: The lack of a repository in the near term means that we have to address extended storage.

978

03:06:56.580 --> 03:07:04.350

Live Meeting: And we are performing R amp D in this area with a lot of great industry support to make sure that our actions can be done safely and efficiently.

979

03:07:04.620 --> 03:07:17.460

Live Meeting: And we of course we've mentioned it before we will say it again advanced reactors when deployed will present a new challenge to waste management, due to the different types and forms of spent nuclear fuel, but this is an opportunity.

980

03:07:17.910 --> 03:07:32.460

Live Meeting: We are conducting the R amp D in support of the advanced reactors spent nuclear fuel and in collaboration closely with allison and we're going to have a solution as soon as those advanced reactors start to produce advanced nuclear waste and we are.

981

03:07:33.540 --> 03:07:37.050

Live Meeting: Making sure that in all of these efforts, we are recruiting.

982

03:07:37.500 --> 03:07:51.750

Live Meeting: A diverse set of perspectives, it is important to recognize that none of us have the single solution to nuclear waste management of we're going to need a large and diverse team to solve this problem with that, I thank you for your time and look forward to your questions.

983

03:07:56.100 --> 03:07:58.890

Live Meeting: Thank you so much, Sam we really appreciate it.

984

03:08:00.060 --> 03:08:08.610

Live Meeting: So now we have time for Q amp a and discussion so i'll turn it over to Maria to start us off there, but this is, you know meant to be for everyone.

985

03:08:10.020 --> 03:08:19.020

Live Meeting: Great Thank you and Sam we really appreciate your energy, thank you for energizing us before we sort of come into the Q amp a session so.

986

03:08:19.530 --> 03:08:25.950

Live Meeting: let's just kind of look ahead here for a few minutes we're going to have Q amp a now then we're going to break for lunch and then we're going to come back and have a discussion.

987

03:08:26.340 --> 03:08:34.860

Live Meeting: Amongst the ENIAC on what we see as priority, so I just want to sort of have in your mind that we're going to have a couple of sessions here where we're going to have discussion so.

988

03:08:35.100 --> 03:08:42.660

Live Meeting: let's use this time, as you think through all of the information that we've learned over the last few hours and it's been a lot.

989

03:08:43.320 --> 03:08:53.340

Live Meeting: use this time I would say to explore, to make sure that you fully understand, whatever the issue was presented, or that if you have you know sort of curiosity about something.

990

03:08:53.550 --> 03:09:03.240

Live Meeting: And then, after lunch we'll use that time more for sharing and sort of thinking about next steps i'm offering that just because I don't want them to sort of blur together.

991

03:09:03.810 --> 03:09:12.030

Live Meeting: So let's use this time in the Q amp a to just ask folks if you have curiosity or questions about information that that was presented.

992

03:09:13.350 --> 03:09:15.480

Live Meeting: Thanks i'll open the floor yeah.

993

03:09:19.140 --> 03:09:27.390

Live Meeting: thanks first of all to everybody for the for the great breach, so it was a very comprehensive and really appreciate it and I and Sam really appreciate the energy at the end.

994

03:09:29.130 --> 03:09:40.500

Live Meeting: brought us back full circle there, so I did want to ask and it's either for Alice or katie you talked in a couple of the briefs about the program and programmatic side of things about.

995

03:09:41.400 --> 03:09:51.900

Live Meeting: The advanced reactor demonstration program quite a few of the programs you touch briefly on a couple of the programs that have to do with advanced construction technology advanced manufacturing.

996

03:09:52.740 --> 03:10:04.740

Live Meeting: If you look at the history of course of cost overrun and cost of development of nuclear worldwide most of that cost overrun is centered on construction management field work.

997

03:10:05.430 --> 03:10:10.020

Live Meeting: overruns and you know poor design that had to be reworked things like this.

998

03:10:10.740 --> 03:10:19.020

Live Meeting: But the last time I checked the the budget for that in the in the budget is fairly limited think the advanced construction technologies was like 5.8 million, I think.

999

03:10:19.680 --> 03:10:27.750

Live Meeting: And so, if I do a comparative analysis of the thing that causes the over and most of the time versus the amount of money dedicated to doing research and how we do.

1000

03:10:28.380 --> 03:10:36.060

Live Meeting: Simplified DEMO you know building these technologies have you given thought to what that would look like in terms of furthering.

1001

03:10:36.390 --> 03:10:49.680

Live Meeting: engagement of things like Civil Engineers so the the construction management things like that and project management, which seems to be the area that we're weakest in and actually deploying the technologies so i'd be interested in your thoughts on that.

1002

03:10:52.350 --> 03:10:57.450

Live Meeting: So, first of all my undergrad was in civil, so this is a topic near and dear to my heart.

1003

03:10:59.040 --> 03:11:12.810

Live Meeting: One thing about the advanced construction technology initiative is that's the government shared, this is a cost shared activity with industry and it has a funding profile, I have to look to see what that is.

1004

03:11:14.250 --> 03:11:20.460

Live Meeting: What encourages me about this initiative is, first, that we're doing it that we're getting started because.

1005

03:11:21.120 --> 03:11:31.980

Live Meeting: Construction isn't something that the office of nuclear energy was doing research and development, and so it was important that we start doing that because it is so critical to new nuclear builds.

1006

03:11:32.880 --> 03:11:47.910

Live Meeting: The other thing that excites me about it is the NRC we have an mo you with NRC to have to be able to share our technical expertise to share data.

1007

03:11:48.660 --> 03:11:54.630

Live Meeting: As we learn things we want them to learn as well, we want them to be a ready and capable capable regulator.

1008

03:11:55.260 --> 03:12:04.560

Live Meeting: So this is one of the activities where they are embedding personnel in with unrich to observe and follow these technologies, because.

1009

03:12:05.250 --> 03:12:18.630

Live Meeting: We have a number of companies that plan to use these technologies in their designs in their license applications and NRC is working to be prepared to receive them so Those are all really good assets.

1010

03:12:19.980 --> 03:12:23.940

Live Meeting: Of that activity so more broadly.

1011

03:12:26.340 --> 03:12:42.210

Live Meeting: In our advanced manufacturing area where these are parts of our budget that we're trying to build up, and so we do have some work and advanced manufacturing around technologies that are relevant for components.

1012

03:12:44.640 --> 03:12:54.540

Live Meeting: In addition to what's covered in the unmarked budget we've got some activities in our our nuclear enabling technologies budget.

1013

03:12:55.410 --> 03:13:12.810

Live Meeting: That we put toward advanced manufacturing and also, you may see something called the transformational challenge reactor appear and disappear, but one of the components of that research and development program also includes advanced manufacturing and they have.

1014

03:13:13.860 --> 03:13:25.590

Live Meeting: Very tangibly demonstrated the relevance of these technologies to industry so with kairos was one of them i'm forgetting some others.

1015

03:13:26.280 --> 03:13:35.040

Live Meeting: Through that program they built components for those designs using these techniques, so that the companies can see.

1016

03:13:35.970 --> 03:13:44.760

Live Meeting: How they can adopt these technologies in their own plans for component manufacturing So hopefully that just hits on a little bit of a.

1017

03:13:45.570 --> 03:13:54.390

Live Meeting: Just a question, have you Have you considered as part of the university program or other education programs tied to ability to train the workforces that might be.

1018

03:13:56.070 --> 03:14:02.820

Live Meeting: you're going to be needing in that you know, because people are actually deploy these if you think you're going to have this massive build out.

1019

03:14:03.060 --> 03:14:14.490

Live Meeting: You need the people available to do that, so it can't just be people who understand how to design a nuclear plant, the specifics of a nuclear island, you have to have people who can actually deploy the technology broadly.

1020

03:14:16.680 --> 03:14:27.030

Live Meeting: that's a really good point workforce development we think about, but I will I will go back and look to see are we missing something in that arena, because they fully you're through with you.

1021

03:14:28.770 --> 03:14:37.350

Live Meeting: i'll add to that to just say you know, while I recognize them fully acknowledge that there is research and development in like construction management and processes.

1022

03:14:37.740 --> 03:14:46.350

Live Meeting: there's also, I think you know it's there's a lot of opportunities to just leverage what's happening outside in other fields, and when we look across offices i'll.

1023

03:14:46.710 --> 03:14:54.060

Live Meeting: i'll resist the urge to speak for them, but the office of technology transitions in do either offs of clean energy demonstrations and LP to.

1024

03:14:54.450 --> 03:15:03.810

Live Meeting: are all deeply involved in kind of that move from our space in R amp D, where you know we're really targeted at this focus on like sort of low to URL technologies.

1025

03:15:04.470 --> 03:15:15.900

Live Meeting: To now this opportunity for demonstration and deployment happening in those offices and so these technology transitions and commercialization endeavors are starting to kind of move in that direction, and so I think what we will see is some.

1026

03:15:16.050 --> 03:15:24.330

Live Meeting: Opportunities for companies and specific deployments to leverage like cross dislike a cross generational and cross technology.

1027

03:15:25.980 --> 03:15:36.630

Live Meeting: options for you know leveraging what's happening in other fields in this construction space, in particular, so I am hopeful that our interactions with those head and ott and elbow will help there.

1028

03:15:37.140 --> 03:15:47.550

Live Meeting: But it's also tied to skilled trades and a broader workforce issue I like in a Union skill space to which, which is also broader issue for our clean energy jobs office.

1029

03:15:49.140 --> 03:15:50.460

Live Meeting: isn't it also tied to.

1030

03:15:51.870 --> 03:16:02.490

Live Meeting: Try to consolidate as much construction or fabrication as possible in a control factory environment minimizing that on the ground stick building type of approach, so I think that's also an element.

1031

03:16:04.710 --> 03:16:05.430

Live Meeting: Thank you so much.

1032

03:16:09.000 --> 03:16:11.820

Live Meeting: So um it's actually Sonia for the record.

1033

03:16:14.250 --> 03:16:15.990

Live Meeting: yeah I had a question for Sam.

1034

03:16:17.220 --> 03:16:21.030

Live Meeting: So beyond the experiments, you mentioned that are internationally.

1035

03:16:21.600 --> 03:16:28.320

Live Meeting: You know, coordinated I was wondering if there is any thought given to international cooperation in waste management and disposition.

1036

03:16:28.710 --> 03:16:34.680

Live Meeting: In terms of also parts going back to the end this presentation in terms of recycling and reprocessing.

1037

03:16:35.670 --> 03:16:45.450

Live Meeting: There seems to be something going on, but is there is there, active, you know other active are the ideas actively being discussed in terms of how.

1038

03:16:46.110 --> 03:16:54.720

Live Meeting: Also to maybe engaged international partners that may or may not be reliable, at the moment, or in the future, and how these connections might lead to.

1039

03:16:56.040 --> 03:17:02.640

Live Meeting: You know leverage in you know future changing political circumstances, including this country.

1040

03:17:05.100 --> 03:17:20.100

Live Meeting: Make sure I understand your question is it about the recycling bow international collaboration, or just in general, waste management, waste management as well yeah awesome so Andy well I start with the waste management, and then there was you So yes, there is a clear.

1041

03:17:21.930 --> 03:17:25.020

Live Meeting: up a perfect anecdote, for this is that.

1042

03:17:26.040 --> 03:17:27.900

Live Meeting: On the Tuesday, that I started.

1043

03:17:29.130 --> 03:17:40.110

Live Meeting: within an hour of being sworn in, I was already meeting with a delegation from cne, which is the French, basically, I would call it, you know their review of nuclear waste management.

1044

03:17:41.280 --> 03:17:52.140

Live Meeting: As they try to figure out ways to actually collaborate and and find out what we're doing that's working what are some challenges that we've been having We obviously commiserated over.

1045

03:17:52.740 --> 03:18:06.090

Live Meeting: variety of different topics, including recycling and advanced reactors and content exciting, so there is definitely opportunity to expand that because, in general, there has been a.

1046

03:18:06.510 --> 03:18:19.020

Live Meeting: question of what can the US bring to the table, and we have astounding research and development capabilities here in United States that we need to start championing so that others will understand that we.

1047

03:18:19.590 --> 03:18:31.980

Live Meeting: We we can learn from the past, to make even better, you know potential international future will that actually be simple, no clearly, and I think that there's going to be the need for.

1048

03:18:32.400 --> 03:18:42.960

Live Meeting: Through a drum and others more leadership to leadership conversations on how experiments don't have to be duplicated right if there are ways that we could be doing.

1049

03:18:43.440 --> 03:18:48.390

Live Meeting: Research that others would be thinking that has been a conversation that many of my international partners already started to raise with me.

1050

03:18:48.930 --> 03:19:03.690

Live Meeting: Is what research can we lead on in the US, as a way to I would call it regain some of that you know seats at the table so Those are some of the way that we're doing it internationally and i'll turn it over to you Andy for the recycling.

1051

03:19:05.490 --> 03:19:17.280

Live Meeting: exam and thanks for the question um, it is important, and like I said there there's a lot we can learn from our international partners, but you know, focusing on like minded democracies and and.

1052

03:19:17.910 --> 03:19:30.780

Live Meeting: and clearly that you know with the sensitive nuclear technology of reprocessing it's not something that we engage with everybody on clearly there.

1053

03:19:31.980 --> 03:19:42.570

Live Meeting: The the experience of France, the UK Japan is very valuable and so they're probably you know our closest our closest.

1054

03:19:43.530 --> 03:19:55.530

Live Meeting: partners on on developing this technology, allowing us to learn from them and and them as well from us because we've continued to innovate in these areas, even though we don't recycle nationally ourselves.

1055

03:19:56.610 --> 03:20:07.830

Live Meeting: likelihood of going back to engagement with you know other countries, I would say it's it's you know, not on the table we'll see.

1056

03:20:11.610 --> 03:20:12.690

Live Meeting: Thank you, Monica.

1057

03:20:18.600 --> 03:20:28.650

Live Meeting: Trying to understand a bit the balance between agility and stability in the programs that you've described, and this is a question for Dr half are really for all the speakers.

1058

03:20:30.570 --> 03:20:42.000

Live Meeting: Alice company gave the example of try so in graphite to development and as an egg's success example and that funding level was about a half a billion.

1059

03:20:43.530 --> 03:20:51.030

Live Meeting: So that was, I guess, an example of stability, which was important to follow through and and bring that.

1060

03:20:52.080 --> 03:21:03.120

Live Meeting: Eventually, to market so Dr have, could you paint a picture of how the 1.6 billion budget is distributed across the programs, I heard about.

1061

03:21:03.480 --> 03:21:14.610

Live Meeting: And where is their stability and where is their agility and how does that balance need to shift in the future, really good, this is a phenomenal question you know.

1062

03:21:15.660 --> 03:21:28.500

Live Meeting: As we plan our budget we're deeply constrained by the budgets of former years and the top line directed to us from our budget planning process and colleagues in the office of management budget who helped to define what the available.

1063

03:21:29.160 --> 03:21:38.460

Live Meeting: Working ground is for our top line budget, so you can imagine a scenario in which you know we're given a top line number, and we have to fit all of our priorities within that number.

1064

03:21:39.060 --> 03:21:49.950

Live Meeting: If we were to achieve everything that's an important policy priority in the Austin nuclear energy, it will cost quite a bit more than what we have available, and so the president's budget request often reflects.

1065

03:21:50.340 --> 03:22:04.500

Live Meeting: A real balancing act of what must be done and what we would really like to have done, and you see issues, for example, around like, for example, the versatile test reactor seen fluctuating support whether it's in.

1066

03:22:05.340 --> 03:22:11.970

Live Meeting: From the president's budget request or in Congress and a lot of that reflects sort of large projects that can be hard to.

1067

03:22:12.660 --> 03:22:21.840

Live Meeting: manage within a constraint top line, particularly when their costs increase year on year, you know most big nuclear projects don't start.

1068

03:22:22.140 --> 03:22:26.730

Live Meeting: With their peak your cost and then drop down, which would be easier to manage in a budget request.

1069

03:22:27.120 --> 03:22:31.800

Live Meeting: But they start with a very small amount of dollars and creep up to a large peak quite large.

1070

03:22:32.130 --> 03:22:39.960

Live Meeting: And then fall down as we sort of progress in the building of a reactor, for example, and that can be hard to plan you're on here, but the budget process is annual.

1071

03:22:40.740 --> 03:22:51.900

Live Meeting: nuclear projects are dedicated and so fundamentally any kind of you know, new initiatives have to be enabled by other things that we put away.

1072

03:22:52.590 --> 03:23:00.270

Live Meeting: New funding or even the growth in this budget that you saw can't be spread like peanut butter over all of our initiatives so, for example.

1073

03:23:00.720 --> 03:23:04.530

Live Meeting: You know, as we see things like the civil nuclear credit program and.

1074

03:23:04.830 --> 03:23:13.200

Live Meeting: The potential for production tax credit, enabling the sustainability of our lightwater reactor is perhaps there's room to reduce our sort of direct support of those reactors.

1075

03:23:13.530 --> 03:23:24.630

Live Meeting: In the future, you know all of this will will depend, but you know, perhaps we reduce our support in that sector in future years, as we advance nuclear you know with advanced reactors in one sense, so.

1076

03:23:25.410 --> 03:23:34.110

Live Meeting: What i'm trying to say is the budget is too small for there to be real agility in a way that you describe, and the stability is reflective of what it's like.

1077

03:23:35.100 --> 03:23:42.930

Live Meeting: Annually essential and forward moving projects, it can be very hard to make room for new initiatives in a budget that is constrained in this way.

1078

03:23:45.330 --> 03:23:46.710

Live Meeting: As a follow on question when.

1079

03:23:47.760 --> 03:23:57.900

Live Meeting: It was really great question great focus, when you say it's too small for agility and you describe it as the God to do's and i'd like to do.

1080

03:24:00.720 --> 03:24:04.320

Live Meeting: What keeps you up at night, what what didn't you fund that you worry about.

1081

03:24:05.400 --> 03:24:08.760

Live Meeting: You know, I think it really is unfortunate that you know.

1082

03:24:09.780 --> 03:24:13.440

Live Meeting: That there are challenges in Congress with btr or that.

1083

03:24:14.580 --> 03:24:26.160

Live Meeting: You know that we can't manage to support the you know these bigger projects over the long term and prepare our congressional colleagues for the possibility that will have these really large scale.

1084

03:24:26.460 --> 03:24:30.990

Live Meeting: increases we've been successful, with the advanced reactor demonstration program, which of course started with.

1085

03:24:31.470 --> 03:24:36.930

Live Meeting: You know appropriations, subject to future appropriations, but then included this bipartisan infrastructure law.

1086

03:24:37.380 --> 03:24:44.790

Live Meeting: Like injection and so it's it's really things like this, these big projects that have to grow over time, because what they do, unfortunately.

1087

03:24:45.120 --> 03:24:54.930

Live Meeting: eat away at some of our fundamental RD scope, you know I think you know we recognize the importance of reducing the burden to the taxpayer and we can't grow to an infinite size Program.

1088

03:24:56.070 --> 03:25:07.650

Live Meeting: But we do have a mission probably about twice the size of our current budget so we do have to manage this priorities and sometimes real fundamental RD close to my heart, suffers like feels like windy.

1089

03:25:10.740 --> 03:25:15.720

Live Meeting: Thanks, did you have a follow up with like I did I have follow up so, for example, the university.

1090

03:25:18.090 --> 03:25:21.240

Live Meeting: reactor infrastructure was mentioned and.

1091

03:25:22.350 --> 03:25:23.220

Live Meeting: Is that.

1092

03:25:24.330 --> 03:25:36.240

Live Meeting: Something that falls within the agility of the funding, or is it something that is supported by previous initiatives and it's sort of a continuation of what exists.

1093

03:25:36.750 --> 03:25:43.830

Live Meeting: i'll comment and all that Alex comment that basically the energy policy act of 2020 and Congressional direction self can give us agility.

1094

03:25:44.280 --> 03:25:55.260

Live Meeting: And in this case were directed to reach to to the maximum extent practicable us 20% of our research and development budget for university programs.

1095

03:25:55.770 --> 03:26:12.360

Live Meeting: By allowing it to be its own line item which is happening less here that activity can be a little bit more broader kind of happened last year and we are allowing that activity to incorporate bigger vision for what the university program can be i'll turn it over to Alice but yes.

1096

03:26:14.490 --> 03:26:22.170

Live Meeting: Yes, so having having the dedicated university line I think is a blessing, but it was also a little bit of a curse this year.

1097

03:26:22.650 --> 03:26:33.480

Live Meeting: Because when we did have the flexibility to pull from different parts of the program we were planning to implement the university program and a level closer to the intent of.

1098

03:26:34.050 --> 03:26:48.000

Live Meeting: of as much as possible practicable to 20% the line item that we were given in didn't really allow for that it it constrained us further than we would have if we were managing it.

1099

03:26:50.820 --> 03:27:01.170

Live Meeting: By taking it from research and development programs, however, what you'll see in our request is our intent to get that line to the level that we think it ought to be.

1100

03:27:01.650 --> 03:27:14.040

Live Meeting: And if we can get our request level supported than that, then it would allow us to do, new things like a substantial revitalization program for infrastructure that could include, for example.

1101

03:27:14.880 --> 03:27:28.380

Live Meeting: one or more micro reactor projects getting started at universities, so our request reflects where we think it needs to be, and we think that Congress did the right thing by doing the dedicated line we just have to bring those two things together.

1102

03:27:31.830 --> 03:27:37.560

Live Meeting: also said that there is Congressional language that really limits us to.

1103

03:27:39.330 --> 03:27:49.380

Live Meeting: Spread funding around with with more discretion and that's largely because of bad behavior in the past, but you know, certainly.

1104

03:27:50.490 --> 03:27:59.430

Live Meeting: I hope that changes, but there should be some flexibility, but we have to be mindful to go back to the appropriators and inform them.

1105

03:27:59.940 --> 03:28:09.390

Live Meeting: that there might be opportunities to improve that balance between stability and agility so that we can be responsive to emerging needs in between budget cycles.

1106

03:28:10.470 --> 03:28:11.850

Live Meeting: But that's proven to be a challenge.

1107

03:28:14.790 --> 03:28:15.150

Live Meeting: Come on.

1108

03:28:18.390 --> 03:28:25.980

Live Meeting: yeah if you allow me i'm gonna ask a few questions and hopefully very simple answers, yes, no in some cases, so that.

1109

03:28:27.360 --> 03:28:41.430

Live Meeting: I can understand some of this before we go into the recommendations on the couple of those are for Alice on the hydrogen production you show the last time I paid attention to it, it was only one.

1110

03:28:42.030 --> 03:29:00.480

Live Meeting: One project now we have four of them, but all of them appear to be around one to two megawatt electric level in 1000 megawatt reactor is what is the limitation on that is that the capital costs is that how much they want to invest, is that the safety, security or.

1111

03:29:01.800 --> 03:29:08.520

Live Meeting: Why i'm paid demonstrating at a slightly larger scale, so they can start looking at their economics really in a meaningful way.

1112

03:29:10.500 --> 03:29:15.960

Live Meeting: So, first, the first projects are going to be with smaller scale.

1113

03:29:17.550 --> 03:29:28.260

Live Meeting: processes to be just to to start introducing it and incrementally approaching how to implement these technologies in a licensed reactor environment.

1114

03:29:28.890 --> 03:29:39.780

Live Meeting: Our later projects are starting to scale up, and so, for example, we have a scope active in the industry funding opportunity right now.

1115

03:29:40.290 --> 03:29:58.950

Live Meeting: we've got one cycle remaining that we're soliciting projects that can help on progress toward that scale up the last of the the projects of the four that I mentioned is getting higher and scale so that was going to be using 50 to 20 megawatts electric.

1116

03:30:00.720 --> 03:30:09.120

Live Meeting: For a demonstration that that award is still in the process of being completed, but so we're starting to see that progression of scaling up and.

1117

03:30:09.480 --> 03:30:25.890

Live Meeting: and ideally we're going to see more and then with the hydrogen hubs that are being supported we're going to even further see utility at scale technologies being demonstrated, is why I asked this question how are we gonna jump from where we are to this hydrogen hub, so I think you.

1118

03:30:27.150 --> 03:30:34.650

Live Meeting: Might the other question I have a quick question is on this uranium enrichment study Andy.

1119

03:30:35.850 --> 03:30:45.870

Live Meeting: Are you also looking at the cases of because, at some point the utilities were also interested about 78% in Richmond for higher burn up field.

1120

03:30:46.530 --> 03:30:56.580

Live Meeting: is, are we looking at that, too, because I understand our current capability limited and said 6% or something so do we have to bump land for that as well.

1121

03:30:57.240 --> 03:31:10.560

Live Meeting: No i'm actually the one us and richer your rank co is in the process of increasing their enrichment ability to enrich up to 10% oh so that's a category three security, you know and.

1122

03:31:11.820 --> 03:31:32.850

Live Meeting: environment, so the expectation, and the reason that they're submitted their applicator a licensed amendment to NRC to reach that is because the prospect of accidental or fuel using the six to 8% not not sure how far the goal but that's the range and and certainly that helps.

1123

03:31:34.080 --> 03:31:38.790

Live Meeting: set them up on the path hi sal you yeah so there's some strategic.

1124

03:31:39.870 --> 03:31:41.580

Live Meeting: I think decision making going on there to.

1125

03:31:43.260 --> 03:31:56.370

Live Meeting: very quick question on the university program katie you're probably the right person to answer that I understand I mean there was there were some some changes in terms of the line item versus how much money and all that but.

1126

03:31:57.240 --> 03:32:06.060

Live Meeting: I understand the more meaningful change to the university programs is we are going to get a little bit more freedom to universities to define their research and and.

1127

03:32:06.450 --> 03:32:15.360

Live Meeting: Perhaps address this agility question as well as part of that are you also looking is it part of the thinking that.

1128

03:32:15.870 --> 03:32:22.380

Live Meeting: We are going to give them a little bit more freedom to start doing some international collaborations of their own with.

1129

03:32:23.040 --> 03:32:34.080

Live Meeting: Other universities us doesn't necessarily need to pay to other countries for their universities, but there are some very good examples, especially in UK in terms of the university.

1130

03:32:34.680 --> 03:32:40.200

Live Meeting: programs that we can partner with, and I think it's gonna be a big multipliers to what we are doing.

1131

03:32:40.620 --> 03:32:47.550

Live Meeting: A lighthouse library, but yeah we've had historically occasionally these like matchy matchy Iraqis, for example, where you know.

1132

03:32:48.390 --> 03:32:59.310

Live Meeting: Work is reflected in the UK, for example, but UK dollars and also in the United States and we're very interested in that kind of thing, and you are right that the biggest change is the thing that was most requested by the Faculty.

1133

03:32:59.880 --> 03:33:06.210

Live Meeting: Which is the like reduction in the prescriptive most of the work scopes which has gotten more and more prescriptive over the last decade.

1134

03:33:06.420 --> 03:33:16.320

Live Meeting: for bringing it back to a place where it's a little bit broader where we're faculty can bring creative ideas that are not yet already established by the programs Alice would you like to add on the international peace.

1135

03:33:17.340 --> 03:33:36.330

Live Meeting: yeah so the UK is a really good example we've we've had a collaborative opportunity with the UK for a number of years now, and that has been very, very successful model, and we would actually like to expand that works we're exploring the ability to expand that model to other.

1136

03:33:37.680 --> 03:33:45.330

Live Meeting: Countries that we would want to have such a partnership with when we evaluate applications, there can be extra points.

1137

03:33:45.900 --> 03:34:00.420

Live Meeting: scored for strategic partnerships to include international partners, so there are there are awards that include international partners, every year, beyond our partnership with the UK.

1138

03:34:03.690 --> 03:34:06.360

Live Meeting: Okay i'll stop here, Maria I have a.

1139

03:34:07.440 --> 03:34:07.920

comment.

1140

03:34:10.350 --> 03:34:21.660

Live Meeting: yeah i'll just note that we after lunch we'll have an hour of discussion, we can, maybe use a little bit of that time for additional questions at the beginning, before you get into your priorities discussion.

1141

03:34:23.760 --> 03:34:25.170

Live Meeting: yeah maybe what we'll do is.

1142

03:34:26.460 --> 03:34:38.850

Live Meeting: Against keep thinking about it let's do did you have something quick I don't know if it's quick or not, but I can hold it it's fine if it goes into prioritization anyway all right great, I would like to get us to lunch, not just because i'm worried, but.

1143

03:34:39.960 --> 03:34:46.650

Live Meeting: i'd like to kind of give our mind a bit of a break and let it just kind of think about some of the conversations that you heard today.

1144

03:34:47.160 --> 03:34:51.630

Live Meeting: And then again when we come back as your as you're eating think about.

1145

03:34:52.590 --> 03:35:05.940

Live Meeting: You know, we heard a lot of information and we could come back and we could imagine all kinds of different gaps and things that we think, need to be worked, but really you know let's keep our eyes sort of on the big picture right there's a deployment.

1146

03:35:07.200 --> 03:35:14.760

Live Meeting: That would be helpful on so many fronts, not only just here in the United States but internationally, we also need to keep a thriving.

1147

03:35:15.510 --> 03:35:21.990

Live Meeting: Innovative pipeline right, so we want to be thoughtful that we don't want to steal, if you will, the R amp D of the future.

1148

03:35:22.470 --> 03:35:36.180

Live Meeting: Just because we want to sort of deploy what we know that we have now, so I guess, I just want you to think about of a continuing cycle, you know what is it that needs to happen now and then, what are the things that we need to do now that's really paving the way.

1149

03:35:36.690 --> 03:35:42.120

Live Meeting: For for the future and just kind of think about that, while you're while you're eating and then, when we come back.

1150

03:35:42.900 --> 03:35:54.000

Live Meeting: i'll probably frame the discussion on what are some of the challenges that we see and then will reflect back on those challenges with, then what work do we think.

1151

03:35:54.480 --> 03:36:07.050

Live Meeting: Do we need to do to help us navigate those challenges, so i'll probably frame it in sort of a negative in terms of what are the challenges that that we see, but just give you some food for thought thanks.

1152

03:36:08.760 --> 03:36:20.250

Live Meeting: Great thanks, so much so, for the folks on the zoom we will reconvene here in about 55 minutes at 130 and for folks in the room there's lots of lunch options across the street at the food court.

1153

03:36:20.760 --> 03:36:26.310

Live Meeting: Over there and for our Members will just be over in the Mount Vernon room across the hall thanks.

1154

03:54:46.740 --> 03:54:50.550

check check one two check check check one two.

1155

03:55:16.200 --> 03:55:49.980

Live Meeting: check check check 123456 check 1234.

1156

03:55:56.610 --> 03:56:01.590

Live Meeting: check 1234 check check 1234.

1157

03:56:04.350 --> 03:57:01.980

Live Meeting: check check 1234.

1158

03:59:51.390 --> 03:59:51.720

hey.

1159

03:59:55.890 --> 03:59:56.760

Comments but.

1160

03:59:58.860 --> 04:00:02.340

They just gotta let me know whether anyone.

1161

04:00:13.890 --> 04:00:14.430

Really.

1162

04:00:20.910 --> 04:00:24.240

Live Meeting: Alright, so i'm just going to an ambitious traveling.

1163

04:00:26.040 --> 04:00:27.780

Live Meeting: object first and just.

1164

04:00:30.420 --> 04:00:35.610

Because i'm uncomfortable with just being a foreign thing that really.

1165

04:00:37.620 --> 04:00:38.100

well.

1166

04:00:44.700 --> 04:00:46.200

hey okay.

1167

04:00:47.730 --> 04:00:55.170

Live Meeting: check check 1234 check check check one two check check check one two check one.

1168

04:01:04.530 --> 04:01:05.100

Live Meeting: style.

1169

04:01:56.880 --> 04:01:57.060

me.

1170

04:07:20.790 --> 04:07:24.600

Live Meeting: check check 1234 check check one two.

1171

04:07:36.420 --> 04:09:01.980

Live Meeting: check check check 1234 check check 1234 check check 1234 check check 1234 check 1234.

1172

04:28:28.110 --> 04:28:36.420

Live Meeting: Good afternoon, everybody will aim to reconvene here in just a few minutes so folks outside the room, if you don't mind making your way back in Thank you very much.

1173

04:32:19.770 --> 04:32:27.840

Live Meeting: Okay, thank you all, I think one or two folks might be making their way back, but we're going to go ahead and move on to.

1174

04:32:28.140 --> 04:32:46.560

Live Meeting: The afternoon portion of our agenda, which is discussion on NASDAQ priorities by the ENIAC members and then forming subcommittees and next steps and so we'll start kind of where we left off with answering any remaining questions, and for that i'll turn it back over to Maria.

1175

04:32:47.790 --> 04:32:56.400

Live Meeting: Okay, great actually what i'd like to do is you know again reflect on all the conversations that we heard this morning and then also just reflect on.

1176

04:32:57.090 --> 04:33:06.510

Live Meeting: Based on your own experience, or, as you know, things that are going and i'd like to begin to focus this discussion on gaps and challenges.

1177

04:33:06.750 --> 04:33:20.340

Live Meeting: So it could be something you heard this morning that you think is a gap or might be a challenge but let's start kind of thinking around it in those terms, because I think from that will be able to distill some priorities.

1178

04:33:21.360 --> 04:33:25.260

Live Meeting: Other i'm a little concerned, otherwise we can have a lot of just conversation.

1179

04:33:25.680 --> 04:33:33.750

Live Meeting: We do have plenty of time we have essentially two hours between now and the next break and in that time we have plenty of opportunity for conversation.

1180

04:33:34.170 --> 04:33:48.390

Live Meeting: And then we're going to distill it and sort of decide of the of that maybe which subcommittees do we think would be helpful to work, the the priority issue, so with that Michael you had your card up first.

1181

04:33:49.500 --> 04:33:55.680

Live Meeting: I was actually just a follow up question about the ldp programs, the ones that were not pulled off into.

1182

04:33:56.760 --> 04:33:59.220

Live Meeting: The the other organization to manage.

1183

04:34:00.720 --> 04:34:05.580

Live Meeting: Do the programs have clearly defined milestones and off ramps.

1184

04:34:06.600 --> 04:34:20.820

Live Meeting: This gets back to Lucas question about flexibility and agility and how you might enable that in the portfolio and by having clear deadlines and points where they're going to be evaluated and perhaps be funded.

1185

04:34:21.930 --> 04:34:36.240

Live Meeting: As off ramps that's a way that you can incentivize behavior but also make decision points that might free up funding in a structured fashion so just curious if if they've been given clear guidance and clear milestones that they're following.

1186

04:34:41.970 --> 04:34:47.010

Live Meeting: yeah so to answer that question it's very specific to the nature of the work being done.

1187

04:34:49.410 --> 04:35:00.300

Live Meeting: For some of the work being done in our labs they will be multi year activities so when we talked about getting alloys 617 through code that was a very.

1188

04:35:00.810 --> 04:35:07.140

Live Meeting: logical progression of activities to get to the point where a code cases being submitted, and you know check mark we're done.

1189

04:35:07.650 --> 04:35:19.830

Live Meeting: same with try so and graphic qualification, we had a radiation, we have P, we have preparation and technical reports there's a there's a tail down to those activities that we can consider that box checked.

1190

04:35:20.280 --> 04:35:33.030

Live Meeting: For some activities like the physical infrastructure that we're talking about like standing up marvel we're standing up the end rick test beds there's also have very structured timelines and funding profiles.

1191

04:35:33.570 --> 04:35:44.370

Live Meeting: And we do have the ability to have an off ramp if the cost is you know the cost of technical challenges going to far exceed what we feel that we can accommodate in the Program.

1192

04:35:45.660 --> 04:35:52.650

Live Meeting: And much heading in the right well i'm mostly interested in the ones where it's a significant public private venture, in other words, oh OK.

1193

04:35:53.160 --> 04:35:59.400

Live Meeting: On the private side are they given you know so when we did this in the Department of Defense we had.

1194

04:35:59.700 --> 04:36:09.900

Live Meeting: Something called a joint concept technology demonstration program you got three years of funding, if you could not demonstrate that you mentioned milestones than you are offering you were you were taken off funding stream.

1195

04:36:10.380 --> 04:36:17.070

Live Meeting: Because you're not going to lead to a commercialized double viable product, and that was a way of ensuring that you always were bringing new.

1196

04:36:18.330 --> 04:36:23.550

Live Meeting: Research into the mix on a recurring basis and not always locking in long term funding.

1197

04:36:23.760 --> 04:36:33.450

Live Meeting: Just because that's what you've done in the last couple of years yeah so for the culture towards that were funded for the advanced record demonstration projects and the risk reduction awards.

1198

04:36:34.320 --> 04:36:44.340

Live Meeting: Those those have a set of milestones that are expected to be achieved through the entire duration of the Ward but every year there's a there's an.

1199

04:36:46.890 --> 04:36:56.430

Live Meeting: Every budget period we go through an application renewal process where we're reviewing to see the progress and we have the the ability to choose not to continue the cooperative agreement.

1200

04:36:56.940 --> 04:37:01.350

Live Meeting: It is a cooperative agreement and the government can back out at any time if it feels that the.

1201

04:37:01.710 --> 04:37:15.690

Live Meeting: The objectives are not being achieved, and not award so that's that's a rigorous Ruby that goes on every time we go to continue the activities under the award look at where we're achieving the milestones and the cost and the schedule.

1202

04:37:17.670 --> 04:37:22.860

Live Meeting: So that's for those awards and I don't know Andy you've got other words with industry.

1203

04:37:24.600 --> 04:37:36.030

Live Meeting: yeah the wall, our main our main award is born on a haley site is the contract at biked in and yeah they're they're termination clauses if they're not performing.

1204

04:37:37.050 --> 04:37:43.860

Live Meeting: And, as I mentioned we're awarding a new contract start up and operate that facility and there'll be the same.

1205

04:37:44.940 --> 04:37:53.220

Live Meeting: On the on the funding opportunities that we have with industry on the accent intolerant field program there are similar to what else describe.

1206

04:37:56.580 --> 04:38:01.500

Live Meeting: Like i'm going to go to you and then stew i'm coming back to you, you actually had your card up before we went to lunch like.

1207

04:38:04.560 --> 04:38:04.950

Live Meeting: I keep.

1208

04:38:06.030 --> 04:38:10.560

Live Meeting: On the presentation this morning I commend you for having integrated.

1209

04:38:11.580 --> 04:38:21.210

Live Meeting: presentations where you could see how they connected to each other on Am I one your thoughts on can you take it to the next level of integration.

1210

04:38:21.990 --> 04:38:39.330

Live Meeting: where you can basically add a lot of the advanced technologies and try to change the perception of it's a waste facility for Sam for energy storage is an advanced technology recycling Center that also has some fuel storage with it.

1211

04:38:39.930 --> 04:38:56.520

Live Meeting: and try to build on some of the other successes and things that are going on, simultaneously, you know, in the United States, for example, you have a very successful for decades, the research reactor take back for in any on.

1212

04:38:57.600 --> 04:39:08.040

Live Meeting: As you go into trying to market vast reactors overseas, if you could do a fuel take back it would greatly enhance I think our market ability.

1213

04:39:08.430 --> 04:39:18.270

Live Meeting: of advanced reactors if we could do that, like some of the total tyrion content countries can do harder for us being democracy, but you could maybe build on that.

1214

04:39:18.780 --> 04:39:31.230

Live Meeting: And also tie that into current negotiations between the United States and Australia about you know, then have a nuclear submarines, it would be sort of like a Non Proliferation black box.

1215

04:39:31.890 --> 04:39:40.290

Live Meeting: You know, he you fuel, of course, but they don't ever go inside it and it comes back after 34 years somehow try to tie those together.

1216

04:39:40.860 --> 04:40:03.090

Live Meeting: With the advanced technology r&d recycling to try to get a a critical mass to have a host say I want one of those and I think that's a wonderful thing to try to tie together, so your thoughts on the next level of integration you're already integrated but.

1217

04:40:04.230 --> 04:40:04.620

Live Meeting: bring it up.

1218

04:40:06.540 --> 04:40:06.990

Live Meeting: So.

1219

04:40:09.120 --> 04:40:24.420

Live Meeting: One one way that we're thinking about that is through this hiring of social scientists social recognize that communities need to be at the table to help us with co development when they tell us what they want, we will have a better chance of.

1220

04:40:25.530 --> 04:40:34.320

Live Meeting: Integrating all these services to make sure that we're ready with the you know advanced technology Center, as you say you know right when they when they need it.

1221

04:40:35.130 --> 04:40:37.680

Live Meeting: Part of that challenge is them knowing what.

1222

04:40:38.190 --> 04:40:46.830

Live Meeting: They want there is there is a limitation on what our Community will know is even an option and that's why it's really going to be critical for Alice Andy and I to.

1223

04:40:47.160 --> 04:40:54.570

Live Meeting: really make sure that all of our ducks are in alignment so that way if a Community says well i'm really interested in advance nuclear fuels.

1224

04:40:54.900 --> 04:41:02.970

Live Meeting: I can connect them with you know some of andy's team to make sure that those services are ready and as well if hey I love this to be you know Co.

1225

04:41:03.360 --> 04:41:12.420

Live Meeting: sided with advanced reactor great let me connect you with my amazing team over there with, I believe that that integration has to be dependent.

1226

04:41:13.260 --> 04:41:23.190

Live Meeting: On the communities themselves actually wanting that type of facility or other committees are going to just say, I just want it to be no co-developed We heard this in the Roi.

1227

04:41:23.550 --> 04:41:37.710

Live Meeting: Some said we don't want anything else with co development we just want it to be a simple parking lot for nuclear fuel for the time being, if that's what the Community wants, then that's the that's the integration that they will get I hope that kind of answer that question a little bit.

1228

04:41:41.370 --> 04:41:48.180

Live Meeting: One of the gaps that I captured in your question lake was fuel take back because you're the only one that sort of teed that up.

1229

04:41:48.540 --> 04:41:54.120

Live Meeting: In the conversation and again i'm going to keep trying to focus less on just broad conversation and more on.

1230

04:41:54.540 --> 04:42:07.020

Live Meeting: Gaps you know what are you not hearing that you think, in this case you're thinking from an international perspective it's a competitive edge for others that they'll say that they'll take back that fuel and us today can't say that.

1231

04:42:07.530 --> 04:42:11.370

Live Meeting: that's a disadvantage for us, so I captured that as a gap stew.

1232

04:42:12.540 --> 04:42:23.280

Live Meeting: Oh yeah I thought we have taking a look at that somewhat and that can be accomplished as kind of a tiered agreement underneath the 123 agreement.

1233

04:42:24.990 --> 04:42:44.010

Live Meeting: it's possible but it requires a multi year persistent effort and it's Interagency as well as Congressional involvement, but it can be done, but it takes it's going to take some motivation and and I, I know that there are some some vendors that are considering that, as part of their.

1234

04:42:45.030 --> 04:42:46.440

Live Meeting: Possible path forward as well.

1235

04:42:49.140 --> 04:42:55.500

Live Meeting: Next, Maria and while I have the MIC also thank the presenters for their presentation this morning, I thought they were all just extremely informative but.

1236

04:42:55.800 --> 04:43:01.650

Live Meeting: I cheated a little bit and I asked Andy my question at launch but I figured maybe i'd ask it now, and let him answer for everybody, as well.

1237

04:43:02.070 --> 04:43:13.710

Live Meeting: because to me anyway from at least my perspective, it gets I think a little bit maybe the prioritization That is how critical is the fuel supply chain issue for existing nuclear plants.

1238

04:43:15.060 --> 04:43:21.870

Live Meeting: You know, is there a risk that existing plants will have a hard time getting fulfilling their refueling requirements and, if so, how soon.

1239

04:43:23.250 --> 04:43:33.120

Live Meeting: So that they got from the system operator seat, am I going to start getting nuclear plants, you know sort of the rating their capabilities, because they have to extend the life of the fuel they currently have because he had to delay refueling all that sort of thing so.

1240

04:43:34.020 --> 04:43:36.900

Live Meeting: That was That was my question and I figured I posted and you in front of the group.

1241

04:43:38.070 --> 04:43:40.560

Live Meeting: yeah so i'll start now.

1242

04:43:41.730 --> 04:43:50.970

Live Meeting: That Dr have clean up anything I mess up, but you know I think there's a lot of uncertainty with the future in terms of how things unfold.

1243

04:43:53.730 --> 04:44:08.160

Live Meeting: One of the reasons why we're motivated to kind of put this out there and get started on a solution is to minimize the kind of disruption that could take place if if restrictions are implemented in a way that aren't really fully thought.

1244

04:44:09.660 --> 04:44:12.300

Live Meeting: Clearly, if there is a supply disruption.

1245

04:44:13.860 --> 04:44:21.510

Live Meeting: There could be some impacted reactors out there some utilities are in a better position to kind of transition.

1246

04:44:22.650 --> 04:44:24.330

Live Meeting: A disruption better than others.

1247

04:44:25.530 --> 04:44:37.650

Live Meeting: But, but clearly, if if there are gigawatts dropping off the grid that's a bad thing um and then and then there's the possibility that the.

1248

04:44:38.550 --> 04:44:58.410

Live Meeting: Supply could be suspended unilaterally by the source at any given moment, and so i'm better prepared than caught flat footed and and we're working it we're working it with with the utilities, with the suppliers, with an API.

1249

04:45:00.000 --> 04:45:02.370

Live Meeting: And we're trying to understand what options we have.

1250

04:45:03.780 --> 04:45:15.510

Live Meeting: But, but really the solutions they start they start with replacing capacity, like we're moving toward we're trying to gain support for, as well as you know, having a.

1251

04:45:16.800 --> 04:45:25.260

Live Meeting: An important strategy or import policy that stabilizes the market long term because it's it's a it's good ish mark as i've mentioned.

1252

04:45:27.570 --> 04:45:42.990

Live Meeting: Thanks, a lot of episodes two things gigawatts leaving the system is bad, especially in the face of the fact that we have so many retirements of current resources ongoing as this resource mix evolution continue so it's just it's just sort of a double whammy at that point.

1253

04:45:44.130 --> 04:45:49.350

Live Meeting: And, really, from my perspective, anyway, I think, step one is transparency, so at least you know you know.

1254

04:45:49.950 --> 04:45:58.950

Live Meeting: For at least from for the people in our in my position anyway, being able to plan for these types of contingencies is step one right then step two obviously is addressing them so maybe they continue to can be avoided.

1255

04:46:00.090 --> 04:46:05.670

Live Meeting: Thanks yeah I do just want to add that, like I think Andy said everything exactly right, the one thing I would maybe just.

1256

04:46:06.000 --> 04:46:14.880

Live Meeting: add is that it takes time to stand up this particular kind of fuel supply chain and that time is interestingly fairly close to the amount of time that we have.

1257

04:46:15.360 --> 04:46:24.840

Live Meeting: And so any there does require some real federal direction and investment to make sure that that happens on a timely basis whether the market responds quick enough.

1258

04:46:25.230 --> 04:46:31.470

Live Meeting: it's not really a question this point like there's a disruption, you know, we need to have already been getting ready for it so that's where we're at.

1259

04:46:32.610 --> 04:46:39.600

Live Meeting: yeah i'll just add on behalf of the industry, it really is a complicated picture half of the utilities don't do business with Russia.

1260

04:46:40.380 --> 04:46:49.380

Live Meeting: So it is really kind of a plant by plant kind of analysis, some plants have purchased fuel very far in advance, some have not.

1261

04:46:50.280 --> 04:47:02.460

Live Meeting: So it begins to be a very particular issue very quickly, I can say, and we have been working with the Department of Energy as they've mentioned to sort of begin new and fresh and kind of get things moving.

1262

04:47:03.060 --> 04:47:11.490

Live Meeting: On both the conversion and enrichment and also to sort of better understand everybody's long term supply.

1263

04:47:12.060 --> 04:47:20.250

Live Meeting: So that there are potentially some sort of loan options that are available for somebody that needs it sooner than somebody else.

1264

04:47:20.910 --> 04:47:30.720

Live Meeting: So there are there are some sort of i'll just say bridge options, but at the end of the day, that's how we should view it that they're sort of bridges and bandaids.

1265

04:47:31.350 --> 04:47:40.920

Live Meeting: With these guys are trying to put in place is just to position the United States in a stronger place for both low enriched in hi sal you.

1266

04:47:41.250 --> 04:47:45.300

Live Meeting: I have confidence that will happen, what I don't have confidence is is what's the time frame.

1267

04:47:46.050 --> 04:47:56.310

Live Meeting: So it's hard to answer your question because it's hard to understand what the time frame is all I can say is today there's not been fuel disruption, so it hasn't been done yet, but we're all concerned that it will.

1268

04:48:03.150 --> 04:48:08.100

Live Meeting: Yes, question, what is the capability in the US for down blending.

1269

04:48:12.330 --> 04:48:24.570

Live Meeting: it's it's limited um we have identified, and this is for hi sal you, we have identified a little over two metric tons of urinal nitrate at savannah river, which is.

1270

04:48:24.990 --> 04:48:36.660

Live Meeting: available for down blending and having available for advanced reactor us there's about a little over 202 metric tons at why 12 in scrap.

1271

04:48:37.560 --> 04:48:48.300

Live Meeting: Our colleagues in NSA or identifying that as something that they are working on to down blend and make available for advanced reactor demonstration of product Program.

1272

04:48:50.220 --> 04:48:55.620

Live Meeting: And, and some of the challenges with that material is that the topics are.

1273

04:48:56.700 --> 04:49:00.450

Live Meeting: Because it was from reprocess fuel the ice topics are.

1274

04:49:02.070 --> 04:49:16.440

Live Meeting: As as they would contaminate the startup of their fuel fabrication capability if they introduce them, as is, and so the the the initial thinking at the moment is.

1275

04:49:17.520 --> 04:49:25.320

Live Meeting: Down blending or diluting that material with freshly enriched you have six from the demonstration in piketon.

1276

04:49:26.850 --> 04:49:33.180

Live Meeting: Until those isotopes are diluted down to the point where they're suitable for introduction to commercial fuel fabrication facilities.

1277

04:49:35.220 --> 04:49:38.250

Live Meeting: And then we're continuing to work with NSA.

1278

04:49:39.450 --> 04:49:41.280

Live Meeting: If you've heard it in any of the the.

1279

04:49:42.630 --> 04:49:54.720

Live Meeting: Discussions that we've had broadly with the Community that we've engaged with something called the couch cushions exercise with NSA where they are going into every nook and cranny and trying to pull out.

1280

04:49:56.700 --> 04:50:03.780

Live Meeting: Every every kilogram or every every you know all quantity and then you know we're getting a little smaller but.

1281

04:50:05.070 --> 04:50:16.500

Live Meeting: they're still going to be a challenge to meet all of our needs to maintain the schedules that are that are expected for the air TV DEMO so so it's challenging but we're continuing to work, the effort.

1282

04:50:19.350 --> 04:50:37.020

Live Meeting: Oh, and I should also mention that there's about 10 metric tons equivalent of vr to fuel that we one of my slides indicated we're accelerating the processing of the ADR to material and making that available, but then again that's that is contaminated material.

1283

04:50:38.340 --> 04:50:45.900

Live Meeting: We awarded the first five metric tons of that 10 to okolloh years ago before a RDP even existed.

1284

04:50:47.040 --> 04:50:53.820

Live Meeting: and have been in discussions with them on standing i'm standing up fuel fabrication capability on site at I NL because.

1285

04:50:54.720 --> 04:51:04.530

Live Meeting: The nature of that award was that the material would stay there, and so a demonstration reacted would have to be on site and close kind of pursuing that path, independent survey or dp.

1286

04:51:06.090 --> 04:51:23.040

Live Meeting: And what is the timeline for ramping up for having hey Lou enrichment capability, no, you talked about the red, so what was the likely timeline or time like after Ward after contract in hand it's on the order of three to four years.

1287

04:51:25.200 --> 04:51:32.730

Live Meeting: And, and you know clearly from a from an acquisition standpoint, we look at options to accelerate that any way, we could.

1288

04:51:37.140 --> 04:51:37.560

Live Meeting: Come on.

1289

04:51:41.550 --> 04:51:45.450

Live Meeting: Thank you, Maria i'm going to focus mostly on on.

1290

04:51:46.470 --> 04:52:03.420

Live Meeting: The presentations we've heard and what I might see as potential gaps, but I want to start my comments on basically trying to reflect where what bill would say in terms of gaps, if he were here so i'll start with the international piece of it.

1291

04:52:05.670 --> 04:52:08.370

Live Meeting: All right, Bill started under any a.

1292

04:52:09.660 --> 04:52:24.840

Live Meeting: While probably four or five years ago and and I 2015 initiative, some of you might have heard nuclear innovation 2015 and so never all bunch of experts around the world, get about 28 countries not together and.

1293

04:52:25.800 --> 04:52:32.910

Live Meeting: As a follow up to that they started their global innovation forum that they had two workshops on far.

1294

04:52:34.440 --> 04:52:54.840

Live Meeting: And the two items that filtered up to the top for nuclear energy from the global perspective on what the what innovation would benefit the most nuclear energy today if we could do it today, they were basically digital twin data analytics and artificial intelligence.

1295

04:52:57.360 --> 04:53:04.410

Live Meeting: The development of digital trends and data analytics and artificial intelligence now.

1296

04:53:07.140 --> 04:53:15.270

Live Meeting: I don't see that explicitly in our in our program in the program However, the pieces are in there.

1297

04:53:16.710 --> 04:53:28.500

Live Meeting: It does it doesn't appear to me that it is a big funding lift, to be able to put those pieces in such a way that became we can easily assemble them and start doing that.

1298

04:53:29.460 --> 04:53:40.980

Live Meeting: And, and I also am aware that, about a year ago NSA started a digital twin exercise primarily focusing on safeguards and security so.

1299

04:53:41.700 --> 04:53:52.170

Live Meeting: it's another opportunity for for me and then I say to collaborate, while they are focused it, you need the same twin to do whatever it is, you want to do so.

1300

04:53:53.220 --> 04:54:08.010

Live Meeting: So anyway, I thought I think it would be worthwhile to consider how we can reassemble the pieces that we already have to start addressing that because it was a global consensus that that is a high priority for your innovation.

1301

04:54:09.300 --> 04:54:16.290

Live Meeting: I thought Scott Ritter, had a pretty good program out of Idaho on digital twin development, I mean I just had a brief from him at.

1302

04:54:16.770 --> 04:54:24.150

Live Meeting: princeton last week, and it was a pretty robust Chris rather is doing that, but that is the NSA program over i'm.

1303

04:54:24.600 --> 04:54:39.810

Live Meeting: i'm referring to, so I think there's an opportunity to piggyback on what's already being done but also put some of the pieces that alice's working on, especially in the area of instrumentation and sensors and the modeling and simulation and couple notes into it.

1304

04:54:41.580 --> 04:54:51.360

Live Meeting: As I said, I don't think it's gonna take a big lift in terms of funding the pieces are in there, I think it's just a matter of repackaging it in their program and integrating it.

1305

04:54:52.860 --> 04:55:01.860

Live Meeting: yeah so we we are actively working on artificial intelligence machine learning and digital twins and we don't have a single program called that but we're implementing.

1306

04:55:02.190 --> 04:55:16.050

Live Meeting: All of those technologies in existing program so i'll just give you some examples in our lightwater reactor sustainability program we have been working with some concert industry awards on applying.

1307

04:55:18.480 --> 04:55:30.870

Live Meeting: artificial intelligence and machine learning to help reduce the cost of maintenance by harvesting data and having predictive predictive maintenance, rather than scheduled based based maintenance.

1308

04:55:31.560 --> 04:55:39.330

Live Meeting: And we've had some real successes with some companies that are making inroads and I was briefed on it or not long ago.

1309

04:55:39.840 --> 04:55:46.740

Live Meeting: The cost savings to industry so so these these young companies are working with existing utilities.

1310

04:55:47.640 --> 04:55:57.480

Live Meeting: And the cost savings like when we talked about fuel optimization and and helping to manage fuel more smartly the cost savings, there is right.

1311

04:55:58.110 --> 04:56:10.860

Live Meeting: Right so we're already seeing like these early supported activities, making an impact in the existing fleet we're we're also.

1312

04:56:11.700 --> 04:56:21.840

Live Meeting: we've got university scopes kind of at the university side to help work on that digital twin was part of the transformational challenge reactor program from its inception.

1313

04:56:22.410 --> 04:56:33.600

Live Meeting: And we are pulling those elements from TC our into our existing programs, like the advanced sensors and instrumentation and advanced manufacturing.

1314

04:56:34.620 --> 04:56:42.030

Live Meeting: to survive TC or as a line item So those are being incorporated into our based programs as part of those programs.

1315

04:56:42.630 --> 04:56:52.620

Live Meeting: Perhaps we can do a better job at having a fact sheet that lays out all of the work that we're doing in this area across this funding lines, so that it can be more visible as a set.

1316

04:56:55.080 --> 04:57:01.710

Live Meeting: yeah Thank you Alice I really think it will be useful if it's a it's a higher level than individual programs.

1317

04:57:02.190 --> 04:57:15.810

Live Meeting: Looking at it by thing it will probably attract a lot more international attention, and you can probably find partners a lot easier, as opposed to looking at one specific type of reactor or one specific type of technology so.

1318

04:57:16.980 --> 04:57:19.950

Live Meeting: It is something that I would recommend the other thing.

1319

04:57:23.610 --> 04:57:29.130

Live Meeting: I want to mention is I mean Andy on the highest failure you.

1320

04:57:30.840 --> 04:57:44.670

Live Meeting: is the only one who use the words chickens and eggs problem in nuclear, but unfortunately I don't think that is the only chickens and eggs, I think we are full of chickens and eggs and nuclear because we are always 15 years behind schedule and.

1321

04:57:45.330 --> 04:57:58.500

Live Meeting: Every time we need something we should have started 15 years ago, and when I look at the entirety of the programs from andy's and sam's analysis presentation, I think.

1322

04:57:59.880 --> 04:58:07.200

Live Meeting: I don't there is nothing in that that I would say, or why are they doing this is just a waste of money, however.

1323

04:58:08.340 --> 04:58:18.180

Live Meeting: I think there is a big in presenting that done in making decisions, I think it would really be good to.

1324

04:58:19.050 --> 04:58:30.360

Live Meeting: clearly identify where that program is really useful and why just became a pick one piece of it and get rid of the other piece, and still get to the end objective of but katie is trying to get.

1325

04:58:31.590 --> 04:58:43.620

Live Meeting: So I don't know whether it's a roadmap, it is, it is some sort of a high level strategic document that basically connects all those dots and show that they are all needed, but they are not needed that.

1326

04:58:44.340 --> 04:58:51.780

Live Meeting: For every program but certain specific objectives, I think that will really be good Defense he had the document along those lines.

1327

04:58:52.890 --> 04:58:53.280

Live Meeting: and

1328

04:58:55.110 --> 04:59:05.430

Live Meeting: For for all the pieces i'm in there, for example, the instrumentation sense assets are really important I couldn't say that, why are we wasting money on instrumentation that centers but.

1329

04:59:06.690 --> 04:59:12.000

Live Meeting: Today, if somebody asked me well, how is that meeting katie's objectives.

1330

04:59:13.020 --> 04:59:14.010

Live Meeting: I have to make it up.

1331

04:59:16.890 --> 04:59:24.810

Live Meeting: I will just flag it you're absolutely right, you know the last public strategic plan from any was in January 2028 just before we left and.

1332

04:59:25.080 --> 04:59:38.580

Live Meeting: While we have had internal strategic documents guiding our milestones annually, we haven't released a new public one, but it is our hope, and I hope we can engage this committee in sort of reviewing it soon, but yeah, it is our hope to release a public one sooner rather than later.

1333

04:59:39.600 --> 04:59:48.570

Live Meeting: Without without revealing my biases or not, there is nothing in there, that I see why, why are we doing this, why are we wasting money on that.

1334

04:59:50.100 --> 04:59:50.550

Live Meeting: But.

1335

04:59:53.490 --> 05:00:05.220

Live Meeting: I I think Ben Ben Ben Ben we are talking about chickens and eggs, I think it's important to identify how the chickens and eggs are line up to the get to the end objective I guess that's what i'm trying to say.

1336

05:00:06.540 --> 05:00:13.230

Live Meeting: Because, as I said, unfortunately, we live in an industry nothing happens overnight, everything is 15 years too late, so.

1337

05:00:14.820 --> 05:00:28.470

Live Meeting: and the last thing I want to, I want to mention, given that we have, we are now the in the fortunate situation compared to 30 years ago where we were looking at zero budgets on nuclear energy research that we have.

1338

05:00:29.580 --> 05:00:45.120

Live Meeting: Plenty of funding to keep our researchers and universities and everybody busy I I really think we can we can take better advantage of international partnerships under the different.

1339

05:00:46.320 --> 05:00:51.990

Live Meeting: again under bill's leadership the Nea put the put together a very good.

1340

05:00:53.280 --> 05:00:57.390

Live Meeting: framework on how we can do joint projects internationally.

1341

05:00:58.410 --> 05:01:04.680

Live Meeting: And it doesn't have to be all the Nea countries, it can be two countries three countries, whatever it is.

1342

05:01:05.490 --> 05:01:15.720

Live Meeting: And, well, I mean let's just face it, we are running out of intellectual resources in this country as well, it takes time to develop those in the meantime, I think we can do a lot better.

1343

05:01:16.560 --> 05:01:27.390

Live Meeting: In terms of partnering really under those joint projects and getting some of those people with their own funding do some of the work that we want them to we want yes so.

1344

05:01:28.320 --> 05:01:40.800

Live Meeting: I would encourage that in all our research, especially data and the areas obviously you're not going to build the reactor under OCD and yet, but we can build the sensors and tested and qualify it.

1345

05:01:42.450 --> 05:01:51.960

Live Meeting: So I would encourage that in all our r&d programs we look at how better we can utilize the international resources.

1346

05:01:54.480 --> 05:02:03.750

Live Meeting: Okay that's excellent and capture that as a gap better advantage of international partnerships and actually that theme can go from not only our end.

1347

05:02:04.080 --> 05:02:19.560

Live Meeting: But it can go into funding actually it can actually bleed over into partnerships with the industry, having international partnerships as well, I mean it sets a really nice foundation and you mentioned universities earlier so it's actually really a broad.

1348

05:02:20.820 --> 05:02:37.020

Live Meeting: belt those projects i'm glad you mentioned that Maria that ball joint project, the way any set that up now, it is very easy to bring in industry, unlike the previous setting the setups that we had on the OECD industry, but it was very difficult to partner with industry but.

1349

05:02:38.130 --> 05:02:44.910

Live Meeting: Now they can be part of that, as I said, it's not across the board for any pick and choose your partners.

1350

05:02:48.330 --> 05:02:51.090

Live Meeting: yeah that's excellent um i'll go to you.

1351

05:02:52.500 --> 05:02:56.580

Live Meeting: Next time ago I had a follow up when the.

1352

05:02:58.770 --> 05:03:00.090

Live Meeting: International Partnership.

1353

05:03:01.560 --> 05:03:04.200

Live Meeting: or training, I think.

1354

05:03:06.210 --> 05:03:26.460

Live Meeting: Thinking through the role that the US might want to have as a leader guys also to training, the leaders of the next industry and the universities are well positioned to train the next leaders so, then the question is, how does one.

1355

05:03:28.920 --> 05:03:35.220

Live Meeting: attract those students from international countries that are to become leaders in the in the.

1356

05:03:36.240 --> 05:03:52.140

Live Meeting: global nuclear industry and maybe ties into funding mechanisms, or maybe ties into agreements with other countries for them funding students to come to come study here, I think that can have.

1357

05:03:53.250 --> 05:04:00.000

Live Meeting: Quite a significant long term impact on the leadership that the US has.

1358

05:04:01.380 --> 05:04:15.120

Live Meeting: In the field, no you're absolutely right that that is another program that they have started that it's the it's called the international nuclear energy fellowship program of the OECD false you don't have to basically participating international projects.

1359

05:04:15.990 --> 05:04:25.200

Live Meeting: And, and I know we have one of those projects United States I don't remember now who's hosting it one of the university is hosting it for the students come directly.

1360

05:04:27.210 --> 05:04:40.080

Live Meeting: They get trained as well as they participate in the project So those are the type of an and that's why I made the comment earlier katie that now that the universities have a little bit more freedom on exactly what they can do with their money.

1361

05:04:40.530 --> 05:04:46.890

Live Meeting: I think we should we should encourage the university to start establishing their own partnerships internationally.

1362

05:04:48.120 --> 05:04:53.790

Live Meeting: So i'm going to jump on in because I know there's a I don't think i've ever done this one without talking to in the meeting so.

1363

05:04:55.950 --> 05:05:05.040

Live Meeting: I wanted to point out that I think the Office does a great job with collaborating across do we, and I said a lot of success, especially with their outreach.

1364

05:05:05.550 --> 05:05:17.730

Live Meeting: With the Ai to working group and some of the things that do with nuclear cyber security in conjunction with NSA and I think we should, I will just put that out there that we should build on those things.

1365

05:05:18.420 --> 05:05:25.980

Live Meeting: just looking at the budget and seeing you know how we stack up as any compared to other offices.

1366

05:05:27.000 --> 05:05:32.970

Live Meeting: And there's a lot of scope creep that it'd be more impactful to make sure that we partner.

1367

05:05:33.390 --> 05:05:46.140

Live Meeting: with other offices, so if you're talking about nuclear cyber security that could be in an essay and Caesar and I know you already have those relationships, but just building upon that so you can maximize on the funding that you get and also.

1368

05:05:46.740 --> 05:05:52.050

Live Meeting: coordinate with them with even more funding that they get that you know could have some synergy.

1369

05:05:52.740 --> 05:05:56.190

Live Meeting: But also, I wanted to talk about the nuclear energy in a global context.

1370

05:05:56.610 --> 05:06:04.950

Live Meeting: And one thing I think that this committee should do is to look at what we're doing I mentioned this during the any six presentation, but.

1371

05:06:05.160 --> 05:06:21.270

Live Meeting: To look at what we're doing across the government as far as international cooperation for nuclear energy, specifically, not so much RD and then see if we can make that more impactful or make that more of a of a bonus.

1372

05:06:22.320 --> 05:06:29.280

Live Meeting: So if you work with the US, this is what you get as opposed to if you work with other people, and what does that look like.

1373

05:06:30.240 --> 05:06:45.360

Live Meeting: Because it's clearly not going to be the ease of funding that is going to have other countries wanting to work with us, but so we need to think about the intangibles that we bring to the table as the US and organize and amplify those to potential customers.

1374

05:06:46.380 --> 05:06:53.220

Live Meeting: And I think we should also look at a framework on if we had a customer, how would we put those in place.

1375

05:06:54.420 --> 05:06:58.860

Live Meeting: quickly and effectively as well, because I don't think we thought that through as well.

1376

05:07:00.720 --> 05:07:10.380

Live Meeting: Can I dovetail with what you said on that if I listened to this it's a there's a model that's been out there for quite a while called build on operate built operate return.

1377

05:07:10.890 --> 05:07:17.010

Live Meeting: Is sort of effectively what Russia does, in some cases, and a lot of the components that I think you've been writing down Maria.

1378

05:07:17.460 --> 05:07:26.040

Live Meeting: tie into that kind of a life cycle model of how we would go about ensuring that we have the financing available to build it how we go about.

1379

05:07:26.580 --> 05:07:36.630

Live Meeting: Providing the support to operate it initially how we go about building the capacity from human capital standpoint in the country to help operators in the future and train their workforce.

1380

05:07:37.170 --> 05:07:49.200

Live Meeting: To to be long term partners in that how we take back the fuel perhaps all those tie into that same kind of a model that would then put us in a much more competitive space.

1381

05:07:49.710 --> 05:07:56.640

Live Meeting: With some of the other countries that have state sponsored industries and, but it has to be a whole of government approach to that.

1382

05:07:57.510 --> 05:08:03.750

Live Meeting: To do that, so you got to have xm bank you got to have the fuel cycle piece of it you've got to have all of that.

1383

05:08:04.260 --> 05:08:12.750

Live Meeting: consolidated and do we can play a role, and he can see certainly play a role in some of that i'll just also pile on to his comments about.

1384

05:08:13.500 --> 05:08:30.060

Live Meeting: working across D, the fusion spaces getting a lot of interest, I think we're missing income a fusion lab if I didn't mention this, and one of the big areas that's a significant need in the fusion spaces of materials research and so to the extent that we're not working across any fcs.

1385

05:08:31.200 --> 05:08:40.530

Live Meeting: Advanced manufacturing some of these other offices that do materials research we're missing an opportunity to perhaps do collaborative work that you can get bigger bang for the buck by bringing in.

1386

05:08:41.520 --> 05:08:50.760

Live Meeting: A lot of the other offices into that mix and so i'd recommend that the last thing is, if we haven't I know Rachel slave all started at the Gemini Program.

1387

05:08:51.270 --> 05:09:05.550

Live Meeting: When she was doing rb work and that had a lot to do with what kamala talked about tied to intelligent assets and how we build those, and so I hopefully we're gathering all that those lessons learned from arpa E into the work that's going on here.

1388

05:09:07.200 --> 05:09:18.180

Live Meeting: And then the last thing is the whole of government approach internally is building that workforce I mentioned it in the project development side, and so I think there's an argument that you should be doing something with.

1389

05:09:20.160 --> 05:09:29.790

Live Meeting: Part of education department of Labor etc that's a whole of government approach to building with proper workforce it's going to be needed to build and operate these systems in the future.

1390

05:09:30.240 --> 05:09:38.310

Live Meeting: And so that kind of a whole of government approach would be, certainly in keeping with what we're already seeing at princeton.

1391

05:09:39.000 --> 05:09:47.130

Live Meeting: With an apprentice program we have going strong tremendous interest from the state and so they've got it they've used us an example of how you build apprentice programs.

1392

05:09:47.730 --> 05:09:57.540

Live Meeting: Those kinds of things, working with the Federal Government State governments to help build the the workforce of the future, I think, is going to be critical, and I can see any having a big role in that.

1393

05:09:58.800 --> 05:10:03.870

Live Meeting: That, then, you know works across not just the nuclear industry and other industries as well.

1394

05:10:07.830 --> 05:10:08.880

Live Meeting: Great thanks Mike.

1395

05:10:11.550 --> 05:10:24.240

Live Meeting: I just wanted to say something encouraging about our collaboration and the fusion area is is it from a research standpoint, we have been working in number of years to coordinate the work that we do, especially where relevant, like in the areas of materials.

1396

05:10:25.350 --> 05:10:27.810

Live Meeting: in manufacturing and.

1397

05:10:29.130 --> 05:10:37.560

Live Meeting: We also work with fusion energy science when they were given the mandate to start interacting with fusion developers and helping them pattern.

1398

05:10:38.040 --> 05:10:44.100

Live Meeting: The way they interact with companies that we've learned through gain so there's been a lot of coordination between game.

1399

05:10:44.610 --> 05:10:52.290

Live Meeting: And the fusion energy sciences office on on how to do that with industry and you'll be happening to even just yesterday I was meeting with the.

1400

05:10:52.590 --> 05:11:11.310

Live Meeting: The lead fusion coordinator for the Agency and discussing how best to support milestone based payments for major demonstration activities which they're interested in, as we are so do next, and you just got to got yeah because it's catchy I think the other.

1401

05:11:12.600 --> 05:11:22.290

Live Meeting: piece of that is that they they actually modeled infuse after game so it's they've already taken taken on some of the lessons from the fusion from efficient space.

1402

05:11:26.130 --> 05:11:33.030

Live Meeting: So we've talked a lot and I appreciate all the conversation that we've heard, I want to maybe just seed the conversation a little bit.

1403

05:11:34.290 --> 05:11:54.300

Live Meeting: We talked a lot today and heard a lot today about these advanced reactors and getting to deployment and in sort of all the work that that goes on for that also spent fuel that has a long road ahead of it, I guess, I would just challenge us let's look 15 years from now, and.

1404

05:11:56.010 --> 05:12:06.780

Live Meeting: And what what it could we imagine in our mind's eye 15 years from now, and what I want the question i'm trying to ask us is, are we doing all the things that we need to do today.

1405

05:12:07.170 --> 05:12:16.620

Live Meeting: To be prepared for what needs to happen, then my challenges there's so much going on right now, I want to make sure that we're not playing off of.

1406

05:12:16.920 --> 05:12:22.770

Live Meeting: Tomorrow, because we're just getting what we need done today and a lot of it requires a lot of money.

1407

05:12:23.220 --> 05:12:32.160

Live Meeting: And so, then, do we begin to underfund, if you will, a pipeline that could be an infrastructure pipeline, it could be an R amp D pipeline I don't know.

1408

05:12:32.490 --> 05:12:39.600

Live Meeting: that's my challenge back to you are we underfunding potentially something now that we're feeling good because we're going to get some things deployed.

1409

05:12:40.290 --> 05:12:50.970

Live Meeting: But we're going to find that we have a gap and it might be a while till it catches might might be a decade before we figure it out could be modeling could be I don't know computing could be.

1410

05:12:52.080 --> 05:13:00.060

Live Meeting: You guys are smarter than me, so I don't know all the things that we have our fingers on from an any perspective, but I don't know chew on that a little bit.

1411

05:13:01.590 --> 05:13:08.730

Live Meeting: Let me give you one example, and maybe that will that will also that will also trigger some additional discussion.

1412

05:13:09.990 --> 05:13:19.830

Live Meeting: The title field programs that we brag about today in terms of how many industries that that program itself.

1413

05:13:20.910 --> 05:13:21.690

Live Meeting: Basically.

1414

05:13:22.710 --> 05:13:35.520

Live Meeting: started the United States, it started in 2004 That was the same year I went boy and help from ourselves, and it was part of the mgmt program with the time next generation power plant.

1415

05:13:38.070 --> 05:13:39.960

Live Meeting: Next Generation nuclear plant.

1416

05:13:41.220 --> 05:13:45.060

Live Meeting: The program got killed three or four years later.

1417

05:13:46.080 --> 05:13:51.090

Live Meeting: on getting traction in terms of cost shared by the industry and, on that, so the program didn't go anywhere.

1418

05:13:51.780 --> 05:14:01.260

Live Meeting: The temptation was to kill the trifle field program nobody needs this feeling remorse by our redeveloping it well, thank goodness we stuck with it.

1419

05:14:01.950 --> 05:14:15.720

Live Meeting: We finished the qualification, it took me 16 years to get to a point where we finally deployed, the final experiment and a qualification is not hundred percent finished yet, but it's almost there, so it takes about 16 years.

1420

05:14:16.590 --> 05:14:28.110

Live Meeting: and have that there were three or four companies that they didn't even exist at that time and the owners of couple of those companies were university professors at the time.

1421

05:14:29.130 --> 05:14:33.420

Live Meeting: They didn't even think they were going to be in the nuclear business and building nuclear power plant.

1422

05:14:33.990 --> 05:14:52.380

Live Meeting: So this is unfortunately our industry, it takes 16 years to trigger somebody to finally do something so your question is very well as Maria is I think if it needs, we have to be thinking about 16 years from today, what did, and not so much what it is that we need tomorrow.

1423

05:14:53.400 --> 05:15:06.180

Live Meeting: And and on another thing I also wanted to request in our discussion liking, it will be really nice to be to come to edge common consensus on what they call a demonstration what we call it deployment.

1424

05:15:06.600 --> 05:15:21.150

Live Meeting: And might be called commercial reactors really it felt good Nice because it sometimes sometimes we tend to get confused about it very, in my opinion, just because we have demonstrated something it's nowhere near being commercials.

1425

05:15:25.290 --> 05:15:39.810

Live Meeting: yeah that's a good conversation there and yeah to highlight and kind of build on what Kemal said um we have been trying to get funding for an accelerated fuel qualification program focusing on metallic fuel, to start with.

1426

05:15:40.950 --> 05:15:51.810

Live Meeting: haven't been totally successful, but I think we got some traction in fiscal year 22 so we're we're gearing up on it, but, but it really brings a lot of the capabilities we've already discussed today.

1427

05:15:52.770 --> 05:16:01.530

Live Meeting: into practice um you know it basically combines the advanced post radiation examination capabilities that we've been developing over the last.

1428

05:16:02.880 --> 05:16:16.230

Live Meeting: 15 years or so, brings them into focus, these are these are technologies that the silicon chip manufacturers basically they put into practice 2025 years ago.

1429

05:16:17.280 --> 05:16:20.160

Live Meeting: and never looked back we're finally there.

1430

05:16:21.630 --> 05:16:32.820

Live Meeting: we've gotten now we have institute instrumentation for fuel experiments which will further inform us on the evolution of material behavior while it's being irradiated.

1431

05:16:33.510 --> 05:16:43.110

Live Meeting: And then, and then the use of high performance computing which is, which is phenomenal I think you layer On top of that even the artificial intelligence.

1432

05:16:43.710 --> 05:16:50.430

Live Meeting: Technology and there's probably more opportunities to accelerate things but but we don't have to take 15 years to qualify fuel.

1433

05:16:51.420 --> 05:17:04.290

Live Meeting: we'd like to do it a lot quicker, we believe we can but we'd like to prove it and, and we are in search of funding to really fully fund this and move on, and this is something that industry is very hungry for as well and they're they're contributing as well, so.

1434

05:17:06.060 --> 05:17:18.630

Live Meeting: A big opportunity there so it's I hear hear speed, and so the thing that I would couple that with this scale, in other words you say, what are we looking at 15 years from now, if we're still just building one or two reactors at a time.

1435

05:17:19.350 --> 05:17:25.980

Live Meeting: Then that's a fail all right, because if we haven't done stuff to to hold you know line the supply chain.

1436

05:17:26.460 --> 05:17:36.900

Live Meeting: and make sure that there's readiness in the manufacturing side to support a larger scale deployment then you're just going to continue to building bills bespoke plants you're not going to have manufacturing.

1437

05:17:37.230 --> 05:17:47.160

Live Meeting: infrastructure necessary to build the module multiples that will make them actually cost effective, because ultimately economics, are still the critical problem for nuclear.

1438

05:17:47.520 --> 05:17:55.020

Live Meeting: And if they can't come bring the price down That means they have to have enough of them they're building then still going to be a fail 15 years from now.

1439

05:17:56.280 --> 05:18:14.340

Live Meeting: The second part of that and i'm sorry for a completely divergent look at it is there's risk in the existing fleet in that 15 years from now, are we still comfortable that those plants that have been operating now for 55 to 65 years are safe and are not going to cause another.

1440

05:18:15.360 --> 05:18:25.140

Live Meeting: Challenging accident that's going to bring everything to a halt, again, and so are we doing the proper amount of research in materials and understanding of the existing fleet.

1441

05:18:25.860 --> 05:18:33.480

Live Meeting: To make sure that they are actually safe I know we've you know we've grown comfortable with the master curve development for brutal fracture things like this.

1442

05:18:33.810 --> 05:18:40.410

Live Meeting: But early on, from 40 to 60 That was really well supported with testing and the existing test program with the existing fleet.

1443

05:18:41.040 --> 05:18:50.580

Live Meeting: i'm not so sure the 60 to 80 is is quite as well as support just my personal opinion, and so I think that we need to make sure that that program continues in the.

1444

05:18:50.940 --> 05:18:59.760

Live Meeting: In the lightwater extension program that we're doing the proper amount of testing to ensure that we don't have a problem 15 years from now, that brings everything holding it.

1445

05:19:02.550 --> 05:19:05.850

Live Meeting: Can I respond to a couple from them on that um.

1446

05:19:06.540 --> 05:19:20.010

Live Meeting: Let me just start with the materials than that last point first that was one of the slides that I called to fit within we still we still have an active materials component in our although vrs program and, specifically, looking at supporting the.

1447

05:19:20.790 --> 05:19:28.590

Live Meeting: The licenses through 80 years so that is still an active part of the program it's just not one of the things that I highlighted so, but we can get you more information on that.

1448

05:19:29.310 --> 05:19:35.790

Live Meeting: The idea of demonstration deployment and commercial products and how to think about those things, and again.

1449

05:19:36.540 --> 05:19:42.870

Live Meeting: The idea that it's a fail if you're only building one or two fully agree, I can tell you that when.

1450

05:19:43.650 --> 05:19:50.580

Live Meeting: projects are selected for supportive government cost share, we may be funding a cost shared first of a kind demonstration.

1451

05:19:50.880 --> 05:20:03.540

Live Meeting: But part of what we consider in selecting those projects is what is their strategy their business case their plans for domestic deployment their plans for global deployment do they have a strategy.

1452

05:20:04.080 --> 05:20:10.020

Live Meeting: And so, not the so the office of nuclear energy can't afford to buy a half of every actor.

1453

05:20:10.380 --> 05:20:19.950

Live Meeting: But these first of a kind demonstrations that we do are really important, because every step through licensing is paving the way for everyone else to follow so we're helping to pull down that risk.

1454

05:20:20.670 --> 05:20:29.190

Live Meeting: And we also have a very engaged loan program office who sees is very much part of their mandate and addressing supply chain and those kinds of.

1455

05:20:29.520 --> 05:20:34.590

Live Meeting: elements that will be essential for broader scale deployment in the United States and abroad.

1456

05:20:35.250 --> 05:20:42.390

Live Meeting: And i'm comfortable with overlapping definitions so many of our first kind demonstrations are fully commercial products they are commercial.

1457

05:20:42.570 --> 05:20:53.010

Live Meeting: Some of them are going to be under duty authorization because they're truly experimental but they're going to be demonstrating some fundamental concepts about the way that these designs will perform so thanks.

1458

05:21:01.440 --> 05:21:04.350

Live Meeting: Oh i'm sorry they come sitting there looking at you're not even notice of my.

1459

05:21:10.350 --> 05:21:19.380

Live Meeting: Colleagues from camel and years, Maria on gap analysis and issues that are not immediately urgent but important for the long term over the.

1460

05:21:19.890 --> 05:21:24.030

Live Meeting: years in the future, and this issue is not one of them.

1461

05:21:24.660 --> 05:21:38.010

Live Meeting: Is not $1 resource matter from Congress, but it's an intellectual challenge for the department and administration, and that is disposal of nuclear waste for current reactors and the future.

1462

05:21:38.550 --> 05:21:48.840

Live Meeting: I think we will work in the interim storage in the short term that we're doing okay that's kind of an urgent matter, but the longer term.

1463

05:21:49.290 --> 05:22:04.440

Live Meeting: disposal of the materials recycling or not Okay, we need to have a path forward because right now, according to administration, what we have in the law is not workable now understand that and we're not going to change that, but we need to.

1464

05:22:05.550 --> 05:22:11.340

Live Meeting: I recommend that the any who inherited the nuclear waste problem okay.

1465

05:22:13.470 --> 05:22:19.110

Live Meeting: we're taught a policy method for how we're going to achieve this, because I think the.

1466

05:22:19.860 --> 05:22:36.150

Live Meeting: The world and our nation is gonna say what about the waist what is the way solution and we have to have an answer for it and there are answers they're not easy, but there that needs to be a component that's a gap, we need to address in there.

1467

05:22:37.410 --> 05:22:39.480

Live Meeting: So i'll throw that on a tape for you.

1468

05:22:47.220 --> 05:23:02.010

Live Meeting: yeah I would agree, and I appreciate Sam you did a wonderful presentation and Andy I think you mentioned it in yours as well, but there's definitely a common theme relative relative to waste I don't think it surprises any of us, but in terms of.

1469

05:23:03.030 --> 05:23:13.650

Live Meeting: You know sort of not only making progress today that we can point to, and I think like your point is, but it needs also sort of a vision for the end game and interim storage or.

1470

05:23:14.250 --> 05:23:24.210

Live Meeting: Consent based citing for interim storage, you know it's a milestone along the road but it's not the end, so I think your your challenges to stay focused on the end game.

1471

05:23:34.050 --> 05:23:45.840

Live Meeting: questions on to build on lakes point about waste, I was wondering about low level waste and also mixed waste, as we have advanced reactors being developed.

1472

05:23:47.610 --> 05:23:52.170

Live Meeting: We hope that there will be many demonstration projects built.

1473

05:23:53.430 --> 05:24:11.250

Live Meeting: And they'll learn as they go along and, at the beginning, they might hopefully they'll decommission also some of their initial units and that will produce low level with not just high level so i'm curious where we stand on low level waste facilities and costs associated costs.

1474

05:24:13.740 --> 05:24:18.000

Live Meeting: And then the other question I had was on infrastructure.

1475

05:24:19.350 --> 05:24:33.240

Live Meeting: We didn't have a lot of discussion on on infrastructure university infrastructure lab infrastructure, what are the what does everybody see as the key gaps there.

1476

05:24:36.240 --> 05:24:38.880

Live Meeting: yeah we need fast spectrum testing.

1477

05:24:43.170 --> 05:24:51.060

Live Meeting: But, but I think other areas of the the laboratory infrastructure are in fairly good health.

1478

05:24:52.050 --> 05:25:12.270

Live Meeting: I mentioned the introduction of the sample preparation laboratory at Idaho that'll help with non alpha contaminated it'll it'll relieve the bottleneck for post radiation examination at Idaho is largely yet the hot fuels examination facility so this will relieve some of that.

1479

05:25:15.390 --> 05:25:22.290

Live Meeting: And, and then, and then I guess the pending Question all channel Tracy bishop, who was not with us today.

1480

05:25:23.310 --> 05:25:28.830

Live Meeting: That that we are going to have to think beyond the existing advanced test reactor for thermal testing.

1481

05:25:29.850 --> 05:25:31.590

Live Meeting: or radiation capabilities.

1482

05:25:32.760 --> 05:25:36.810

Live Meeting: But I would start with the fast spectrum is a big gap.

1483

05:25:38.820 --> 05:25:52.680

Live Meeting: And to go back to your low level always question you know there and Sam can clean me up if I get this wrong but there for low level waste facilities that are currently operated and licensed by the NRC operating in the US there's like barnwell and Clive utah couple others.

1484

05:25:53.970 --> 05:25:56.160

Live Meeting: And so those those manage low level waste.

1485

05:25:57.180 --> 05:25:57.960

Live Meeting: material.

1486

05:25:59.220 --> 05:26:00.990

Live Meeting: And there's capacity for growth.

1487

05:26:03.150 --> 05:26:11.400

Live Meeting: boy I get in I guess the one area greater than classy the office of environmental management is working on that and I think they're close to a solution.

1488

05:26:12.840 --> 05:26:28.500

Live Meeting: To add a little bit a minor gap that exists, I think, in any world space, as you start to look at Vance reactors and some of the waste streams from recycling and processing that they may have, you may end up with.

1489

05:26:29.040 --> 05:26:43.770

Live Meeting: likely will end up with commercial transoceanic waste which isn't you could call it great in class C, but it's a unique legal waste that we don't have capacity for United States for commercial true waste.

1490

05:26:44.310 --> 05:27:00.660

Live Meeting: We have Defense true waste whip but that's not going to work for us in any space, so I think it's it's a minor gap, but it is a gap that ought to be somewhere in the any system, besides me I was going to take care.

1491

05:27:02.280 --> 05:27:07.050

Live Meeting: We do still operate under the policy premise of the.

1492

05:27:08.310 --> 05:27:17.640

Live Meeting: Oh heck how are we referring to this D commingling of Defense and commercials and fuel so there's current there's a policy still in place from the Obama era that like.

1493

05:27:19.140 --> 05:27:26.340

Live Meeting: We should consider them separately with this is something that sounds office has the sort of the rain to rely with this kind of policy.

1494

05:27:29.640 --> 05:27:34.140

Live Meeting: And just as a touch on the infrastructure piece of course we do operate, out of a national laboratory.

1495

05:27:34.440 --> 05:27:41.160

Live Meeting: Tracy Bishop deaths on that you know infrastructure side there's a great deal we could have spent a great deal of time in this introductory space.

1496

05:27:41.490 --> 05:27:53.640

Live Meeting: On her topic areas and what's what's happening at national laboratory in particular it's a large fraction of our budget I think it'll be an important thing, maybe to address and featuring the meetings I think she wasn't available today.

1497

05:27:59.250 --> 05:28:03.810

Live Meeting: Your answer what's your question answered really enough otherwise great to make sure.

1498

05:28:10.230 --> 05:28:11.190

Live Meeting: yeah Sonia.

1499

05:28:12.750 --> 05:28:20.880

Live Meeting: Thank you, so I wanted to ask a few questions about this constant based approach.

1500

05:28:22.590 --> 05:28:24.240

Live Meeting: But not just related to nuclear waste.

1501

05:28:26.040 --> 05:28:27.960

Live Meeting: Because I think when we once we start.

1502

05:28:30.030 --> 05:28:36.030

Live Meeting: shifting our our starting point to communities lay communities.

1503

05:28:37.290 --> 05:28:50.010

Live Meeting: We may shift away from the priorities that the experts in this room have laid out for us and the priorities that have persisted over apparently a very long time, because when I saw the you know the slide that.

1504

05:28:51.540 --> 05:28:58.170

Live Meeting: Perhaps showed us about you know the nuclear today and nuclear tomorrow and all the goals that were listed there.

1505

05:28:58.410 --> 05:29:09.510

Live Meeting: I couldn't help but remind myself that you know those were goals that were listed in 1955 at the first Geneva conference on the peaceful uses of atomic energy that's the optimism is definitely comparable.

1506

05:29:11.100 --> 05:29:20.700

Live Meeting: So i'm just wondering if we shifted our starting point to concentrated to Community generated goal, making and priority setting.

1507

05:29:22.080 --> 05:29:40.890

Live Meeting: Would that shift the balance between the expert authority and the and you know what what we actually want what kind of technologies we actually want what kind of infrastructure, we can organizations, we actually want a need to be able to trust them to accomplish those goals and.

1508

05:29:42.120 --> 05:29:56.970

Live Meeting: Some of those goals that I didn't hear mentioned, or only heard mentioned in passing today was, for instance, liability for nuclear accidents and not just at nuclear power plants but also anywhere in the fuel cycle.

1509

05:29:58.800 --> 05:30:08.160

Live Meeting: jack Goodman mentioned international accords that this country is maybe not you know, a member of but also certain domestic legislation.

1510

05:30:08.790 --> 05:30:11.970

Live Meeting: What are the emergency response strategies that exist.

1511

05:30:12.930 --> 05:30:24.330

Live Meeting: That are being developed and how can new threats be integrated into those, for example, military conflicts involving nuclear facilities, this is something that is new right because.

1512

05:30:25.170 --> 05:30:33.840

Live Meeting: With all the insider threat considerations with all the terrorism considerations, we have we have kind of hardened nuclear facilities against those but military conflict.

1513

05:30:35.580 --> 05:30:46.470

Live Meeting: At a you know at a scale that we're seeing now is is relatively new because nuclear power plants have been built after the last world war right, so this.

1514

05:30:46.980 --> 05:31:00.870

Live Meeting: This is a new situation that that hasn't really affected at least nuclear power plants in the United States and in Europe, so how can we prepare for that and also how can we assist if that happens elsewhere, other than sending strongly worded.

1515

05:31:02.040 --> 05:31:02.550

cables.

1516

05:31:04.860 --> 05:31:12.540

Live Meeting: And then the The other point that was mentioned that I just wanted to to add on to his training and workforce that is.

1517

05:31:13.740 --> 05:31:29.490

Live Meeting: You know, not just engineers not but also not just program managers I realized this is a gap that that may may need to be addressed but, but people who can hold complex goals at the same time in their in their brains so.

1518

05:31:30.840 --> 05:31:50.790

Live Meeting: For example, and more interdisciplinary comprehensive training where students are taught to think about power reactors and bombs about safety and economics about reactor designs and waste repositories about energy security and international color collaboration.

1519

05:31:51.990 --> 05:32:05.970

Live Meeting: about the interaction of nuclear crises with public health emergencies military conflict regime change, etc, and how, how can we set up training programs that will deliver people like that.

1520

05:32:06.990 --> 05:32:18.180

Live Meeting: That can then not end up you know, and maybe one small room at a hotel, but that actually can work in the industry and colonize the industry, ideally internationally.

1521

05:32:20.910 --> 05:32:33.780

Live Meeting: So I can start, even if it's content based not just waste I think it's a it's a really good catch so so in consent based lighting there's two major and i'm speaking to you obviously know this already but.

1522

05:32:34.350 --> 05:32:43.080

Live Meeting: For the for the room there's two major issues at play procedural justice and distributive justice and both have applications to other.

1523

05:32:43.410 --> 05:32:47.280

Live Meeting: pieces not only just energy but nuclear energy, specifically as well.

1524

05:32:47.640 --> 05:32:55.080

Live Meeting: If you're talking about liability that's that's a procedural justice will, if something goes wrong i'd be okay well the system.

1525

05:32:55.380 --> 05:33:04.170

Live Meeting: protect me, that is, it is something that we can learn from contemporary citing maybe if we do it if we're again, as the person who is currently hiring a social scientist.

1526

05:33:05.070 --> 05:33:23.070

Live Meeting: To try to do this work if we are able to take some of those and address other gaps that could, that is, that is possible right because we, we can concentrate on the waist and then apply it more broadly, and then your point onwards development is exactly why we have the challenge of.

1527

05:33:25.200 --> 05:33:33.180

Live Meeting: hiring people with a with a specific area of you know, nuclear waste of their background is extraordinarily difficult.

1528

05:33:33.960 --> 05:33:37.140

Live Meeting: Luke and I just actually came from a workshop where.

1529

05:33:37.680 --> 05:33:51.090

Live Meeting: With education is extraordinarily rare it's very difficult to actually find a lot of students and there's duster pipeline is not not met, but it's because of your COMP points about complex schools So yes, socio Technological Studies social sciences.

1530

05:33:52.230 --> 05:34:01.440

Live Meeting: The the hiring practices, who would be a better address and workforce development could be better address if we stopped looking for just nuclear engineering as as a.

1531

05:34:01.860 --> 05:34:08.790

Live Meeting: As a soul system, but that doesn't mean that we shouldn't have the infrastructure of those reactors at.

1532

05:34:09.210 --> 05:34:18.210

Live Meeting: Flights again I was a I was a policy student who got to work at a reactor on my campus because that was giving me better training on.

1533

05:34:18.480 --> 05:34:30.960

Live Meeting: To be holistic that I could understand the policies that I was going to maybe write one day what their effect would be on the reactor, I was working at, so I think that it's a good thing, hopefully, that was helpful response.

1534

05:34:34.800 --> 05:34:43.740

Live Meeting: Mike oh i'm sorry else I was just going to respond to you had a lot there and i'm going to try to keep track of some of the things that I wanted to mention.

1535

05:34:45.150 --> 05:34:50.940

Live Meeting: So we mentioned that one of the benefits of having a line item for university support is is allowing us to have much.

1536

05:34:51.540 --> 05:34:59.610

Live Meeting: less prescriptive broader work scopes and one of the things that we definitely sought out in the work scopes they're going to be coming out soon.

1537

05:35:00.030 --> 05:35:11.610

Live Meeting: Is the ability to have multi disciplinary projects that brings together, not just engineers and scientists, but other social scientists and others in a more multi disciplinary approach for some of these.

1538

05:35:12.090 --> 05:35:29.130

Live Meeting: scopes, and so we expect to be holding our webinars soon to be able to discuss the work scopes with the Community and we'll make sure that you all get a chance to see them, and I would be very much interested in your reactions, do you see that opportunity and what we're laying out.

1539

05:35:30.300 --> 05:35:36.450

Live Meeting: On on communities and engagement, you know, beyond the consent based setting for us fuel.

1540

05:35:37.470 --> 05:35:47.160

Live Meeting: gain has been working with local communities in in stakeholder engagement and capacity building and it's definitely an area that I think.

1541

05:35:48.120 --> 05:36:03.690

Live Meeting: Having communities, be able to tap into the resources of our national labs in the tools and knowledge that they have in that area is something that we're looking at how can we expand to help on a more regional and local and community level engagement with with the technologies.

1542

05:36:04.710 --> 05:36:09.690

Live Meeting: And then on the international side just within our university programs.

1543

05:36:11.400 --> 05:36:17.970

Live Meeting: One of my staff reminded me that, even from 2019 to 2022 we had 27 projects with international partners.

1544

05:36:18.630 --> 05:36:28.350

Live Meeting: And we do interact with the Nea activity, the acronym is nest I always forget what it is, but but we look for opportunities in our work scopes to build.

1545

05:36:28.860 --> 05:36:44.190

Live Meeting: The ability of international students to actively engage on the work that we're supporting, so I think that is helpful and I I think it's worth taking these ideas and seeing what can we do more and better, as we you know, continue to shape our programs moving out.

1546

05:36:45.270 --> 05:36:45.480

Thanks.

1547

05:36:49.560 --> 05:36:52.500

Live Meeting: Thanks Andy do you want to go next remind yeah i'll be good.

1548

05:36:53.610 --> 05:37:00.930

Live Meeting: yeah I am yeah so so yeah you had you had a lot to unpack there, but it was excellent, very challenging question Sam.

1549

05:37:02.550 --> 05:37:04.800

Live Meeting: Thank you for that that was really helpful response.

1550

05:37:06.090 --> 05:37:18.750

Live Meeting: I it's kind of anecdotal, but I am seeing more partnership between engineering and social science department at universities, so I think that's a positive trend, but I think there's more work to be done so, I totally agree with that.

1551

05:37:19.890 --> 05:37:32.790

Live Meeting: Regarding regarding you know what risks or liabilities communities are are accepting when when they engage in this just on a purely you know relative and not really.

1552

05:37:34.440 --> 05:37:45.720

Live Meeting: Quantitative basis I I say, I would say that the the store just spent nuclear fuel and the disposal of spent nuclear fuel high level waste is are very low risks.

1553

05:37:46.380 --> 05:38:01.380

Live Meeting: When you start doing chemical processes in more industrial activities more r&b it gets elevated and and clearly before any any community.

1554

05:38:02.250 --> 05:38:12.450

Live Meeting: should consider something like that they need to be fully informed of what those risks are involved so that's got to be a really I totally agree that's got to be a really important part of the conversation so thanks for that.

1555

05:38:13.800 --> 05:38:25.890

Live Meeting: Mike yeah if we consider maybe part of our role is to help say how to help you set priorities or looking at prioritization or how you how you set that I guess the.

1556

05:38:26.790 --> 05:38:40.230

Live Meeting: question would be Have you looked at some of the challenges you're facing with some of these these technic Technology Options whether it's hydro production dissemination all these other things and evaluated them in the context of which have the greatest economic.

1557

05:38:41.670 --> 05:38:47.700

Live Meeting: You know benefit to pursue sooner, and so, in other words cheering some of your research portfolio.

1558

05:38:48.240 --> 05:38:54.510

Live Meeting: towards which ones are going to be the most viable near term alternatives for nuclear technologies to support.

1559

05:38:55.410 --> 05:39:00.270

Live Meeting: Work that i've seen done in the past hasn't had very good, especially in the US.

1560

05:39:01.080 --> 05:39:17.610

Live Meeting: outcomes from an economic standpoint for desalination, but it has for hydrogen, but if you could take it overseas Maybe those flat flip flop right and so understanding the where and where the benefits, maybe for for the technologies and that might help you prioritize some of the work.

1561

05:39:18.690 --> 05:39:30.600

Live Meeting: And then looking for gaps still Maria so to see this we haven't talked a lot about regulatory issues there's been some findings that you know are potentially beneficial certainly the most recent one about sm ours and.

1562

05:39:30.990 --> 05:39:46.830

Live Meeting: And citing and population zones was looks like it could be advantageous but there may still be still be work to do there to look at what that means in the context of deploying in cities and in higher population regions, what does that mean.

1563

05:39:47.910 --> 05:39:51.840

Live Meeting: And what work is left to be done from an analytic standpoint to support that.

1564

05:39:52.500 --> 05:40:03.930

Live Meeting: Because there's still some some question about the the methodology, they may dictate, in the final regular regulation so thinking about that, with the useful work and then final thought is.

1565

05:40:04.560 --> 05:40:13.080

Live Meeting: Well it's not an issue for internal deployment if we're going to have an international market and the there's I know concerns from.

1566

05:40:13.680 --> 05:40:28.020

Live Meeting: One of the Academy studies is still going on, that was was from briefings that were going on related to liquid fueled and pebble bed reactors in terms of accountancy and monitoring, and so, if you're going to try to deploy those technologies, how are you meeting the standards.

1567

05:40:29.910 --> 05:40:43.680

Live Meeting: For accountancy and knowing that you've got the right technologies to monitor those is critical to be able to say that you have a valid case for deploying them and that you know that you're going to get approval to export that technology from the US Government.

1568

05:40:44.700 --> 05:40:48.240

Live Meeting: So just some random thoughts, there are things we haven't talked about.

1569

05:40:49.980 --> 05:40:57.090

Live Meeting: Thanks Mike i'm going to come back to you to I think Come on, you know Okay, do you go to go ahead, thank you well.

1570

05:40:58.050 --> 05:41:04.830

Live Meeting: So I know we're running out of time for general discussion, so I do want to speak a little bit about some of the cross cutting priorities.

1571

05:41:05.550 --> 05:41:16.290

Live Meeting: That we talked about it put out there that i'd love to see our fire even fly opportunity on the opportunity for some of the cross cutting priorities.

1572

05:41:16.800 --> 05:41:22.290

Live Meeting: Improving diversity in nuclear engineering, the environmental justice and the jobs in the American workforce.

1573

05:41:23.100 --> 05:41:31.860

Live Meeting: Because they are, I would say, not the primary mission, but still important, I think it might be a good idea to outsource.

1574

05:41:32.640 --> 05:41:41.610

Live Meeting: Instead of trying to develop the capability to tackle those in house set our priorities and what we'd like to see, and then open that up.

1575

05:41:42.000 --> 05:41:58.080

Live Meeting: I think that's also a great opportunity to pull in some small businesses, which is also always a name with do in government and also pull in some minority organizations, personally I think if we're talking about improving diversity.

1576

05:41:59.520 --> 05:42:13.980

Live Meeting: People who look like the Community that you're trying to attract are the people who should be implementing that so I want to get that in before we have to switch gears that that's something that's very important hard to tackle is a tight tightly.

1577

05:42:15.150 --> 05:42:19.410

Live Meeting: staffed organization and that might be a way forward for that.

1578

05:42:22.200 --> 05:42:28.650

Live Meeting: I will flag that alice's group in the last set of ips for the university program included, for example, and I rp on.

1579

05:42:28.950 --> 05:42:44.760

Live Meeting: Supporting you know workforce gap analysis it's you know to be done via like an interdisciplinary group and the other one on social relationships with what I don't know how to describe this, but it can simply saving energy justice sort of focused one.

1580

05:42:45.780 --> 05:42:48.030

Live Meeting: So I rp i'm sorry i'm not.

1581

05:42:48.840 --> 05:43:00.840

Live Meeting: familiar with that acronym it's an integrated research project, and these are ways of working with universities, where multiple universities can collaborate together and it's an extended activities, so it allows for a lot of work to get done in a stable way.

1582

05:43:01.560 --> 05:43:17.550

Live Meeting: Thank you, so I should do more of that to your point oh so I, I agree, but sometimes I think you also have to put it out there to the business or Community organizations as well, so I love the universities, I spent a lot of time in a few.

1583

05:43:18.960 --> 05:43:26.820

Live Meeting: Maybe almost half my life, but I do think also there is some Community based organizations that we should be tapping into.

1584

05:43:27.450 --> 05:43:34.980

Live Meeting: Because it's not all from the research side and if you're talking about the pipeline, you know if they're not getting into university.

1585

05:43:35.760 --> 05:43:45.570

Live Meeting: Maybe we need to start a little younger and thinking about how we can do that, or even charging other organizations with developing that capability on our behalf.

1586

05:43:48.810 --> 05:44:00.570

Live Meeting: Thanks TIM yeah I have a quick comment I know this is not a gap in the programs because you're not able to hear me talk about the.

1587

05:44:01.800 --> 05:44:02.310

Also.

1588

05:44:03.630 --> 05:44:15.270

Live Meeting: particularly interested in any any NASA collaborations that lunar base reactor program is boring moving forward, as I understand it.

1589

05:44:16.530 --> 05:44:37.890

Live Meeting: I believe that any has a lot to contribute to in that area or anything any should be should be heavily involved in the design and I do not know where we stand, right now, but unfortunately, in the past to be the we have just important technologies from.

1590

05:44:40.710 --> 05:44:41.850

Live Meeting: Space program in.

1591

05:44:42.960 --> 05:44:51.360

Live Meeting: Based program and then we take that, but the constraints are so different that i'm worried just the just because something works well on earth it's.

1592

05:44:51.810 --> 05:45:01.140

Live Meeting: Not necessarily going to work well and any has to be a very strong part of it, so in the next meeting meeting I will be very interested in hearing from.

1593

05:45:01.560 --> 05:45:12.900

Live Meeting: From Tracy in terms of of the collaboration is going and what that stands it's not in a program but certainly in the resources will be here to life and shouldn't eat too much.

1594

05:45:15.480 --> 05:45:16.950

Live Meeting: Thanks come on that somebody had there.

1595

05:45:20.160 --> 05:45:29.340

Live Meeting: Just as a quick comment on that it's not even just NASA anymore, you know there's interest from space for us and God has interested in space reactor technologies and like.

1596

05:45:29.670 --> 05:45:37.410

Live Meeting: You know I do think that it's becoming a little bit more broad in a way that any can be a centralizing technological expertise locale.

1597

05:45:39.420 --> 05:45:44.130

Live Meeting: I have a broader question, if I can get a word in here before somebody else puts their card up.

1598

05:45:45.330 --> 05:45:55.230

Live Meeting: what's the expectation of any in educating the general public, I guess, as I look ahead with all the things that we've talked about.

1599

05:45:56.580 --> 05:46:03.180

Live Meeting: there's a job there, to get the public sort of educated and kept along the way.

1600

05:46:05.220 --> 05:46:13.800

Live Meeting: I don't know that they know a lot about today's reactors, but we listed a whole lot more than today's reactors in our conversation just sort of interested in the.

1601

05:46:14.850 --> 05:46:16.500

Live Meeting: sort of broad public education.

1602

05:46:18.330 --> 05:46:26.250

Live Meeting: yeah I will say it's the federal government's duty to communicate to the public how we're spending their taxpayer dollars at a fundamental level like that's our baseline.

1603

05:46:26.520 --> 05:46:33.810

Live Meeting: To do more and achieve our mission in addition to that, it succeeded at nuclear energy, I think we do recognize that communications is critical.

1604

05:46:34.050 --> 05:46:42.810

Live Meeting: Right now, we we are, we have some open positions and our communications team, because we think that part of our team can be bigger than it currently is and can be a little bit more cross cutting.

1605

05:46:43.260 --> 05:46:56.430

Live Meeting: But you know I think I really do think that it goes beyond just public education and goes to a place of like non deficit model kind of interactions where instead we like truly get a little deeper into engagement with with the public and that.

1606

05:46:56.970 --> 05:47:01.590

Live Meeting: Costs more and takes more time and is harder but it's it's something I would like to see us do more.

1607

05:47:03.900 --> 05:47:06.840

Live Meeting: Do you think your funding to need or is that a gap.

1608

05:47:09.150 --> 05:47:14.100

Live Meeting: was going to add into that I mean years ago I know and our dog rooster have.

1609

05:47:16.020 --> 05:47:27.870

Live Meeting: to train the trainers yeah science high school science curriculum for advanced technologies and energy and was focused on waste, but.

1610

05:47:28.350 --> 05:47:35.430

Live Meeting: This theory there's any have such a program still where it's to go out to the teacher and teachers, unions and such.

1611

05:47:35.820 --> 05:47:42.630

Live Meeting: yeah so we collaborated with discovery education and as on there oh heck does anyone remember what it was called.

1612

05:47:43.530 --> 05:47:55.290

Live Meeting: CNS ti that that has a program that you use that link has a bunch of curriculum and stuff for elementary school students that they use in the teacher training and we actually had to revive it this last year because they.

1613

05:47:55.770 --> 05:48:03.270

Live Meeting: got weirdly subsumed into the discovery channel's paywall and we like retrieve it back from behind a paywall this year.

1614

05:48:04.530 --> 05:48:05.910

Live Meeting: With an s itself, obviously.

1615

05:48:07.920 --> 05:48:15.600

Live Meeting: Any I probably kind of it, so I would say that me and I used to have a collaboration with the boy scouts and girl scouts which I used to love.

1616

05:48:16.890 --> 05:48:28.590

Live Meeting: And they do that, every year, so there is curriculum adele and I just was passing allison note, but you know if that's something that we can collaborate on and even you know develop it for school districts.

1617

05:48:29.070 --> 05:48:36.150

Live Meeting: And, and you know kind of do the train the trainer that you were talking about late for school districts, or even a module that you could put into.

1618

05:48:37.140 --> 05:48:42.990

Live Meeting: A course that's like a chemistry course or physics course so that you can introduce this.

1619

05:48:43.380 --> 05:48:55.650

Live Meeting: side you know this not nuclear engineering specific, but you can get that topic out there, because I think a lot of people, especially me, I was not a nuclear engineering undergrad you know it's something that I stumbled upon.

1620

05:48:56.310 --> 05:49:13.500

Live Meeting: Because I wanted a free trip somewhere, you know and, and here I am stuck Nessa gladly here, so we want to make sure that we can expand that exposure in ways that are sustainable to the capabilities we have, which I think is a great idea of the train the trainer.

1621

05:49:16.020 --> 05:49:23.910

Live Meeting: Playing for a moment that were a few minutes past where we are schedule says we would transition to the forming subcommittees and next steps portion.

1622

05:49:27.630 --> 05:49:31.770

Live Meeting: Thank you for that reality check to you, Mr Sam Thank you so much.

1623

05:49:32.940 --> 05:49:36.390

Live Meeting: Like I did want to to say that you know we haven't completely forgotten.

1624

05:49:36.750 --> 05:49:47.730

Live Meeting: Part of as you, as I mentioned in the funding opportunity announcement is capacity building and education on spent nuclear fuel management now it's very clear that's one very tiny piece of a big nuclear puzzle.

1625

05:49:48.090 --> 05:49:59.190

Live Meeting: But it is a puzzle piece that gets a lot of attention so one could say that, yes, we are still definitely also doing education specifically Nuclear Fuel Management side, so you want to make sure that that was also raised.

1626

05:50:07.830 --> 05:50:08.610

Yes, okay.

1627

05:50:13.470 --> 05:50:14.310

Live Meeting: We talked about.

1628

05:50:15.870 --> 05:50:18.690

Live Meeting: Acknowledging the history.

1629

05:50:20.190 --> 05:50:22.530

Live Meeting: Sorry i'm trying to shorten my many comments.

1630

05:50:23.730 --> 05:50:28.380

Live Meeting: We talked about acknowledging the history of maybe the fuel cycle and some of the harms that were done.

1631

05:50:29.670 --> 05:50:37.890

Live Meeting: In specific communities, and I wonder if this ties into communication and education today and how the narratives are.

1632

05:50:40.260 --> 05:50:50.370

Live Meeting: Maybe still being solicited from communities as so that we don't have one narrative that we teach, but there are multiple narratives from multiple communities that.

1633

05:50:52.440 --> 05:51:05.700

Live Meeting: could be facilitated, to be read to the table and maybe that's also that's a way of of opening the conversation and communities that are not currently part of the conversation, so if that's too abstract but.

1634

05:51:07.410 --> 05:51:15.810

Live Meeting: So maybe more specifically kick kick are we engaging with tribal colleges or communities that.

1635

05:51:17.070 --> 05:51:23.880

Live Meeting: and none of that not necessarily on the stem education side, even in the history class is, these are these narratives being.

1636

05:51:25.020 --> 05:51:25.890

Live Meeting: Written.

1637

05:51:27.120 --> 05:51:29.220

Live Meeting: by those who experienced it or.

1638

05:51:30.300 --> 05:51:33.180

Live Meeting: Or are they being written by one voice.

1639

05:51:39.420 --> 05:51:40.860

Live Meeting: I would, I would just.

1640

05:51:42.030 --> 05:51:51.900

Live Meeting: yeah I don't I think trying to write it with one voice is probably counterproductive, because there are many views of many experiences and they should all be kind of acknowledged.

1641

05:51:54.600 --> 05:52:07.710

Live Meeting: And I think I think kind of in in in sam's area of pursuing consent, they citing third party voices can potentially be more influential than our own voice.

1642

05:52:08.490 --> 05:52:20.880

Live Meeting: So inviting those into the discussion, I think, are is going to be helpful, and I think you know looking to to the energy communities alliance which is a group of communities that host do we laboratories and facilities.

1643

05:52:22.650 --> 05:52:32.580

Live Meeting: they've lived around nuclear stuff for decades and and that's that's a voice that I think is really important.

1644

05:52:34.290 --> 05:52:38.250

Live Meeting: Having having communities for international you know.

1645

05:52:39.510 --> 05:52:40.950

Live Meeting: Having the voices of.

1646

05:52:42.120 --> 05:52:49.320

Live Meeting: Foreign cities that host repositories is going to be an important voice the discussion.

1647

05:52:50.640 --> 05:52:59.640

Live Meeting: You know, so I think I think the more voices, the better, because I think you know well, yes, there are critics out there there's a lot of people that have.

1648

05:53:01.410 --> 05:53:02.640

Live Meeting: Have experiences.

1649

05:53:03.810 --> 05:53:17.490

Live Meeting: With nuclear technology near nuclear facilities and and why would we be asking communities to host a facility without talking to those the communities with experience.

1650

05:53:25.530 --> 05:53:37.350

Live Meeting: yeah I just want to weigh in on on a couple things one, I think that in looking at any kind of collaborations or what what have you that it's not necessarily cookie cutter and that you know it's not a one size fits all and.

1651

05:53:38.370 --> 05:53:47.730

Live Meeting: As i've just learned through through my my country boy up bring in is that you know you have to remember the audience and you need to remember who you're talking to to make sure that it's tailored.

1652

05:53:48.210 --> 05:53:55.050

Live Meeting: and addressing to the people that that have concerns, and I think we can look at many different levels but it's just really.

1653

05:53:55.620 --> 05:54:02.430

Live Meeting: Trying to address some some things that maybe recognizing that everybody's filling out on the same level.

1654

05:54:02.820 --> 05:54:13.020

Live Meeting: Secondly, that that is having some consistent messages, but adapted to whoever whomever that we're that we're talking to and and.

1655

05:54:13.590 --> 05:54:20.460

Live Meeting: Most importantly, I think some of the dynamics in dealing with tribes, specifically because one of the things when we talk about stakeholders.

1656

05:54:21.120 --> 05:54:30.630

Live Meeting: stakeholders is always the common term that's used, and so we want to talk to all stakeholders will stakeholders include the boy scouts girl scouts the environmental club and what have you.

1657

05:54:31.170 --> 05:54:39.930

Live Meeting: But there's a unique relationship between tribes in the federal government and so oftentimes tribes are listed as stakeholders, but you know there, there needs to be.

1658

05:54:40.320 --> 05:54:47.940

Live Meeting: Some consideration given there because I think it would be just analogous to like if we were talking about foreign countries and let's just talk about them as stakeholders as well.

1659

05:54:48.510 --> 05:54:57.960

Live Meeting: And wouldn't refer to them as nations and and so there's some of that that the dynamics that we think we have to consider is just building on some of the other conversations that were.

1660

05:54:58.710 --> 05:55:05.310

Live Meeting: happening that I think with with the back end of looking at the waist and what have you that we need to figure out.

1661

05:55:06.000 --> 05:55:09.780

Live Meeting: You know those solutions, because I think from the tribal side that you know.

1662

05:55:10.440 --> 05:55:25.050

Live Meeting: Everybody wants to figure out a solution, sometimes we just can't come to an agreement on how we're going to move stuff from point A to Point B and we're agreeing upon where point B is is located, and so, if we can't even come to terms with that or trying to work internationally.

1663

05:55:26.430 --> 05:55:31.950

Live Meeting: Realistically we could ask the question, do we really have all of our ducks in a row, and are we really.

1664

05:55:33.210 --> 05:55:42.840

Live Meeting: prepared to say Okay, this is a great deal we're going to sell you this car without a warranty kind of thing as well, I don't know if I want to buy that so, so I think we just need to look at it.

1665

05:55:43.830 --> 05:55:54.990

Live Meeting: Again, and this is just the old country boy logic just looking at it and figuring out how how we need to proceed cautiously but progressively I think in the future.

1666

05:55:59.430 --> 05:56:00.060

Live Meeting: Thank you, Richard.

1667

05:56:02.340 --> 05:56:12.930

Live Meeting: Okay i'm gonna i'm going to try to guide us into a conversation again, with all that that we've just now sort of chewed on and tossed about i'd like to transition.

1668

05:56:13.890 --> 05:56:26.400

Live Meeting: To a conversation around subcommittees this is challenging because it's not trying to it's not trying to scratch every itch that has been brought up that's not the goal of the exercise, the goal of the exercise is.

1669

05:56:26.820 --> 05:56:34.830

Live Meeting: Everything that we heard are there some buckets that seemed to make sense that a smaller group of people.

1670

05:56:36.090 --> 05:56:47.220

Live Meeting: Could sort of pull that thread a little bit more, and so I open that I guess i'll start with I think spent fuel has to be one.

1671

05:56:47.640 --> 05:56:51.570

Live Meeting: And Sam it doesn't mean we don't think you're not going to do a fantastic job.

1672

05:56:52.350 --> 05:57:03.270

Live Meeting: I just think there are just so many elements to it, you know, Richard just brought it up, you know it's not just about engaging communities it's engaging them the right way, and you know she brought it up.

1673

05:57:03.840 --> 05:57:13.380

Live Meeting: as well, so I think there's just going to need to be a lens on sort of what's this approach on on spent fuel just for an ongoing.

1674

05:57:14.010 --> 05:57:21.150

Live Meeting: conversation that i'd suggest that it's not only the interim storage, but it also is to the long term storage lake, which is a point you brought up.

1675

05:57:21.660 --> 05:57:32.280

Live Meeting: and also the commercial true waste, which is something that you that you mentioned, as we go down the path for for hey Lou and I think we could probably toss reprocessing in.

1676

05:57:33.090 --> 05:57:43.050

Live Meeting: In terms of again, what do we imagine the end game to be our in our question I would guess, as we would go through this committee isn't that we're going to come up with all the right answers so much is.

1677

05:57:43.350 --> 05:57:56.910

Live Meeting: You know, is, do we any exploring things going down a path that looks right and has the right sort of long term long term approach I just think that road is so full of.

1678

05:57:58.770 --> 05:58:05.790

Live Meeting: me add the secretary spoke to this when she was at songs and she said something she was going to test this group.

1679

05:58:06.420 --> 05:58:18.960

Live Meeting: Luke could you tell us exactly what she said, so we can kind of make sure, as we define it we pick up whatever she said yeah absolutely um that is a subcommittee that we have.

1680

05:58:20.580 --> 05:58:33.630

Live Meeting: Technically, give delivered a charge to chair MAC would for so that's one of X number of subcommittees that will be established so that's kind of the the starting place glad.

1681

05:58:34.140 --> 05:58:47.910

Live Meeting: Maria started there because that one is maybe one foot ahead of any others that you all decide to recommend at this meeting, we just did we define what this is helpful, I know what she's sick.

1682

05:58:49.080 --> 05:58:58.020

Live Meeting: there's actually in the letter from Kenya, not from Andy I think about the content site so we'll figure it out what's.

1683

05:58:58.710 --> 05:59:12.870

Live Meeting: funny trail on it, but it's it's fantastic that we were directed to do what we just chose to do so, this hanging together very nicely yeah there, there is a copy of the letter that was signed by.

1684

05:59:14.160 --> 05:59:21.600

Live Meeting: At the time, acting acting as Andy on April 18 and that's in the back of the packet.

1685

05:59:24.810 --> 05:59:25.260

Live Meeting: Okay.

1686

05:59:26.280 --> 05:59:36.210

Live Meeting: i'm going to throw out some concepts and what I ask is for your insight in terms of maybe the best way for them to hang together or if they hang together.

1687

05:59:36.690 --> 05:59:45.600

Live Meeting: From a subcommittee perspective, we talked a lot about international partnerships and you brought it up Come on, but, but others.

1688

05:59:46.140 --> 05:59:51.870

Live Meeting: You know sort of brought them up, we talked about it in terms of R amp D sharing Kemal I think that's what.

1689

05:59:52.500 --> 06:00:01.230

Live Meeting: What you suggested, I heard it also, I think, from lucca on universities are there, opportunities for some international partnerships there.

1690

06:00:02.010 --> 06:00:17.010

Live Meeting: On the commercial side, I think I mentioned, you know if we got into this sort of rhythm of this International Partnership, I think it spills over to projects where internationally we're we're working together Come on, it might even help us answer, how do we get.

1691

06:00:18.090 --> 06:00:28.680

Live Meeting: That versatile test reactor that we're all passionate about because maybe there's more International Partnership available for for stuff like that right which is not only the R amp D to get it done.

1692

06:00:29.010 --> 06:00:40.860

Live Meeting: But it's money and it's also a project, and then they could use the product is as well, so in in my mind, I came up with this sort of combination of things around international.

1693

06:00:41.340 --> 06:00:55.140

Live Meeting: partnerships and I guess i'm tossing it out there for reaction and for you to to chew on it, I don't know from a subcommittee if we would just sort of explore, are we thinking broad enough on international.

1694

06:00:56.610 --> 06:01:02.820

Live Meeting: I don't know exactly all the directions that would go it just feels like there's something there, there could we.

1695

06:01:03.570 --> 06:01:11.160

Live Meeting: partnerships is one way of looking at the other way, to look at is international competitiveness competitiveness, in other words that maybe bronze it into how do we.

1696

06:01:11.580 --> 06:01:21.180

Live Meeting: Look at all the facets, that would make us vendors competitive internationally yeah certainly the partnerships is an aspect of that, but then making sure that we've addressed all the things that.

1697

06:01:21.510 --> 06:01:29.460

Live Meeting: would make us competitive from the technology itself etc so that's that maybe a broader approach, because you can lose more things in.

1698

06:01:32.220 --> 06:01:36.780

Live Meeting: I really like that a lot so international competitiveness is what we're.

1699

06:01:39.030 --> 06:01:50.850

Live Meeting: What we're chewing on at the moment, so thoughts about making would that be useful, from a subcommittee perspective does it feel like there's something worth you know sort of pulling the thread on.

1700

06:01:55.050 --> 06:02:02.070

Live Meeting: I think there is, I think that we we've talked We talked earlier about the xm bank talked about things like that that would right, how do we enable financing.

1701

06:02:03.780 --> 06:02:11.250

Live Meeting: mechanisms to help compete against state owned industry and that's really what you're trying to do you're trying to develop those things that gives you a whole of.

1702

06:02:11.910 --> 06:02:23.550

Live Meeting: A an approach that the US can compete when the other people offer kind of a whole package deal we're, how do we put our package deal together has got to be we've had to look at that.

1703

06:02:24.660 --> 06:02:27.420

Live Meeting: And you started to use that whole of government word.

1704

06:02:27.960 --> 06:02:39.510

Live Meeting: set of words, maybe its international competitiveness and a whole of government approach because that's kind of what we talked about too is there's an any piece to this but it's also any leveraging.

1705

06:02:40.410 --> 06:02:51.240

Live Meeting: You know sort of the the broader government, and I think that might take us in some some some interesting directions, so I am also interested in.

1706

06:02:52.050 --> 06:03:00.060

Live Meeting: Exactly what might put forth however i'm not sure if they exact approach we should be looking at this whole of government, because that has.

1707

06:03:00.480 --> 06:03:11.610

Live Meeting: been examined, but within that whole of government approach and the team USA approach that we have, what can we do specifically to sweeten the pot or to.

1708

06:03:13.140 --> 06:03:28.050

Live Meeting: Make that something more viable that can be again deployed quickly and effectively, because I don't want us to get into the habit of trying to solve everybody's problem, but you know kind of the serenity, let us handle what we can handle and.

1709

06:03:29.250 --> 06:03:30.450

Live Meeting: accept what we cannot.

1710

06:03:31.680 --> 06:03:35.940

Live Meeting: So I hear what you're saying is be careful, maybe that the scope doesn't get too broad.

1711

06:03:36.180 --> 06:03:47.460

Live Meeting: Maybe I would challenge that we think about it from a whole government approach and then bring it back to any to say what can any do just so that we're not limiting ourselves too quickly.

1712

06:03:48.150 --> 06:03:52.350

Live Meeting: But I hear what you're saying we're not trying to give recommendations to the State Department right.

1713

06:03:54.060 --> 06:03:54.420

Live Meeting: and

1714

06:03:57.510 --> 06:04:08.130

Live Meeting: Maybe one also one element to be highlighted here is safeguards by design and the role that international leadership has in.

1715

06:04:08.610 --> 06:04:20.130

Live Meeting: Promoting international safe, first by design so maybe working together with NSA there was really important I agree so like we're not going to you know send.

1716

06:04:20.700 --> 06:04:32.580

Live Meeting: A massive nuclear engineers over there, to build a reactor, but we do have experts and safeguard, we do have experts in cybersecurity so can we put those elements together, because those are things that we have some.

1717

06:04:34.410 --> 06:04:42.690

Live Meeting: leader not leadership, but control or influence on, as do we, and he that is world class and resides here.

1718

06:04:46.620 --> 06:04:51.480

Live Meeting: How many subcommittees are we thinking about i'm trying to see.

1719

06:04:54.240 --> 06:04:58.890

Live Meeting: Well, if you start going to that level of detail, it sounds like we're heading in.

1720

06:05:01.050 --> 06:05:04.980

Live Meeting: That yeah I think we're just grouping, so we can downsize so that's exactly right.

1721

06:05:06.360 --> 06:05:08.130

Live Meeting: It might just be sorry.

1722

06:05:09.270 --> 06:05:10.800

Live Meeting: I just wanted to see if you are awake come on.

1723

06:05:12.330 --> 06:05:12.630

Live Meeting: I don't.

1724

06:05:14.790 --> 06:05:18.120

Live Meeting: know so I don't know actually i'm just thinking of a small handful.

1725

06:05:18.840 --> 06:05:32.040

Live Meeting: But right now i'm just trying to group i'm trying to group ideas that I heard and see if that would make a useful exercise it's also okay if we form a subcommittee you pull the thread we explore it for a little bit and you say you know hey.

1726

06:05:32.520 --> 06:05:38.880

Live Meeting: I don't know that there's enough applicability you got it so just because we invent it today doesn't mean it has to live for 10 years.

1727

06:05:39.750 --> 06:05:43.530

Live Meeting: i'm just trying i'm just trying to quickly synthesize you know from the conversation.

1728

06:05:43.770 --> 06:05:53.400

Live Meeting: That I heard, but if you think it's a terrible idea you're allowed to just raise your hand and say I don't think there's anything there there i'm not I don't have any pride in this i'm just trying to TEE up thoughts.

1729

06:05:54.630 --> 06:06:07.770

Live Meeting: i'm assuming that the ad hoc subcommittees are still alone, like the old days that we will be able to put a subcommittee together for just for one task, and they would go do it, and then they would go away so i'm assuming those are still okay katie.

1730

06:06:10.650 --> 06:06:12.690

Live Meeting: I don't see nothing preventing that.

1731

06:06:15.270 --> 06:06:26.820

Live Meeting: seems to me that international competitive competitive, this is a good overarching theme for for group for imprint committee and then then wherever.

1732

06:06:27.480 --> 06:06:36.690

Live Meeting: We go it sounds like consent Bay siding with something else that kind of came up and different ones that emerged i'm just I mean just thinking about it from from my purview.

1733

06:06:37.440 --> 06:06:45.840

Live Meeting: yeah I agree so right now there's like two on the table there's a spent fuel pool adventure no excuse me spent fuel and I didn't say pool spent fuel adventure.

1734

06:06:46.350 --> 06:07:01.110

Live Meeting: Which is interim storage consent based citing long term storage sort of wherever that's going to go and then the second one has some international competitiveness flavor those are those are the two that that will considering so far, others.

1735

06:07:02.490 --> 06:07:06.750

Live Meeting: So i'd like to propose a subcommittee on the on the cross cutting.

1736

06:07:08.520 --> 06:07:24.300

Live Meeting: Issues the diversity any energy in environmental justice are in jobs in the American workforce and what i'd like to promote propose what i'd like to propose for this committee is not to necessarily put together.

1737

06:07:26.340 --> 06:07:32.640

Live Meeting: a plan of action, but maybe to guide, so we could give it to me to implement like.

1738

06:07:33.360 --> 06:07:43.560

Live Meeting: Should we work with Community organizations and maybe put together, like some thoughts to guide how you will put that together, and also to gather some of the information, because I know you guys have already been working on that.

1739

06:07:43.980 --> 06:07:58.050

Live Meeting: And to provide us with that information, maybe we can synthesize it and talk to our organizations and best practices and guide that as an rfp or Fo a or I rp or any other combination of letters that you'd like to.

1740

06:07:58.650 --> 06:08:06.960

Live Meeting: throw together and a new acronym will continue to see that and covering the entire issue of workforce development or food tasting tied to.

1741

06:08:07.380 --> 06:08:13.440

Live Meeting: So I think that this needs to be narrowed down um because there's a lot in that.

1742

06:08:13.920 --> 06:08:23.370

Live Meeting: And it could be narrowed down to the point where we get it to like this is what you should put an Roi that's not too broad and then we'll see what the best ideas are and fun those.

1743

06:08:23.790 --> 06:08:30.960

Live Meeting: I don't even know how that mechanism works or if you can do that, but maybe we can suggest some things to do some of the legwork for you all.

1744

06:08:31.470 --> 06:08:37.800

Live Meeting: Right i'm just harking back to the discussion we had all day or other issues time to work for so you said, are going to be critical to.

1745

06:08:38.100 --> 06:08:48.090

Live Meeting: supporting development of these technologies around the world, yes and grow that So yes, so I think we just your question should we have a separate one on workforce, I said he's that's where he said.

1746

06:08:49.200 --> 06:08:56.910

Live Meeting: Something that envelops it I think he's wondering if there's enough as a standalone right oh workforce, so I might be was putting them all together because.

1747

06:08:57.360 --> 06:09:09.570

Live Meeting: Honestly, I think it should be RSI and then see what we get back and see if there's enough for us to send out put out a full Fo away on one of those or to see if there is enough for just a standalone one.

1748

06:09:10.080 --> 06:09:18.990

Live Meeting: So to gather information for that, but we need to start somewhere in there it's just so broad So yes, that was my katie has her current katie.

1749

06:09:19.800 --> 06:09:30.180

Live Meeting: yeah I hear what you're saying I do want to sort of just scope that like you can't run our programs for us and decide what Fo ways to run, but what we can do it, which I think might get to what you're suggesting.

1750

06:09:30.510 --> 06:09:35.160

Live Meeting: Is provide a lot more information about exactly what we are doing and implementing in.

1751

06:09:35.610 --> 06:09:43.590

Live Meeting: Diversity equity and inclusion energy justice and environmental justice and jobs in the American workforce going full deep dive with the subcommittee.

1752

06:09:43.890 --> 06:09:52.980

Live Meeting: And then see what your recommendations are for what we should be doing what clothes, we might release i'd like to provide this is about things that you may want to consider coming up.

1753

06:09:54.210 --> 06:09:58.260

Live Meeting: So is that, given that is that an agenda items, rather than a sub.

1754

06:09:59.430 --> 06:10:10.590

Live Meeting: How much How would you how would you look at that, because I know subcommittee I imagine sort of lives, a little bit longer, but it maybe it starts with more of an agenda item, where we do a deeper dive.

1755

06:10:11.430 --> 06:10:19.560

Live Meeting: And then we understand yeah then we understand what's needed is that something that we want to involve the entire committee in doing I guess that so that.

1756

06:10:19.980 --> 06:10:28.650

Live Meeting: To me, would determine whether that's a subcommittee or if that was an agenda item at the next yeah what's what's a suggestion.

1757

06:10:29.310 --> 06:10:35.250

Live Meeting: Others of books, I would think there has to be some maybe some discussion on it, and the reason being that.

1758

06:10:36.150 --> 06:10:44.250

Live Meeting: For tribes, for example, if you look at the executive order for environmental justice and there's a calculus there for whether or not you qualify for an.

1759

06:10:44.820 --> 06:10:55.350

Live Meeting: Environmental justice or you don't and so, if you don't meet that then then you're kind of not considered, but from a tribal point of view there's still a responsibility to deal with the tribe, whether or not you.

1760

06:10:55.830 --> 06:10:59.910

Live Meeting: You meet the standards of environmental justice so so I somehow we just need to.

1761

06:11:00.330 --> 06:11:11.160

Live Meeting: gather the facts and then maybe kind of consider where we want to go from that, but I mean it doesn't mean that we shouldn't talk about environmental justice because it's important for those that meet the qualifications to be impacted.

1762

06:11:11.970 --> 06:11:25.860

Live Meeting: still do need a workforce, the more broadly, you know it has to be diverse in etc, but that there's a broader question of just having the workforce available, more broadly, that we have to worry about how we're going about building then.

1763

06:11:28.290 --> 06:11:38.490

Live Meeting: Has there been I thought there was a workforce report from any okay that's I think we're thinking of something maybe two years ago, I became out of.

1764

06:11:39.690 --> 06:11:57.300

Live Meeting: You know I made the rounds in academia, but I don't remember when it came up Okay, so my only also another concern i'll put put out there and I don't know how to address it, but if we leave it to the next meeting, that means it doesn't get addressed until the next meeting.

1765

06:11:59.700 --> 06:12:00.210

Live Meeting: Which is.

1766

06:12:01.230 --> 06:12:01.860

Live Meeting: tbd.

1767

06:12:04.620 --> 06:12:11.940

Live Meeting: I think that's a very good point she and the other point I think that may be worth discussing on this is.

1768

06:12:13.350 --> 06:12:25.740

Live Meeting: These are questions they're specifically hard for us because of their cross cutting nature and they apply to everything, including programs we're.

1769

06:12:26.520 --> 06:12:36.330

Live Meeting: Implementing you know today, as well as the questions that Maria brought up of in the framing of what is necessary in 15 years and so.

1770

06:12:37.170 --> 06:12:46.020

Live Meeting: I think you all might want to think about how you can address those two kind of I mean it's it's a continuum but.

1771

06:12:46.710 --> 06:12:58.170

Live Meeting: You know what question are you trying to answer and that might help determine what you want to do in terms of whether it's a workforce subcommittee or you know, an agenda item, etc.

1772

06:13:01.050 --> 06:13:08.310

Live Meeting: So I don't know if we know yet, let me just put it on hold gta because it's still an issue why don't we pull the thread a little bit more on workforce.

1773

06:13:08.610 --> 06:13:19.530

Live Meeting: And let's just try it on for size, a little bit like what are the kinds of things that we would imagine that we would cover if we had a workforce one, then we can come back to to to the question.

1774

06:13:20.250 --> 06:13:28.200

Live Meeting: That that you have Mike you have your you have your card up but i'm looking at your so you had a comment earlier about workforce, what are your thoughts.

1775

06:13:29.820 --> 06:13:36.480

Live Meeting: Well, the the issue, as we were discussing it earlier is, do we have sufficient workforce in areas that are going to be necessary.

1776

06:13:37.230 --> 06:13:50.310

Live Meeting: This is to your I think 15 years leaders question in areas that are going to be necessary, not necessarily just in actually development of the specific technologies, but in the broader issues of civil engineering.

1777

06:13:51.360 --> 06:13:56.100

Live Meeting: The workforce is going to eventually heck even regulate them let's say the NRC.

1778

06:13:57.060 --> 06:14:12.570

Live Meeting: to your populating a lot more actors out there they're not going to they're going to need a much broader workforce, and so are we doing the things necessary both specifically to broader larger fleet and then also.

1779

06:14:14.010 --> 06:14:22.710

Live Meeting: Developing the skill sets that are going to be necessary long term to help build capacity overseas let's say so, if you want to.

1780

06:14:23.220 --> 06:14:30.600

Live Meeting: say what is one of the biggest risks internationally it's that there's no capacity and some of the regulatory side over and.

1781

06:14:31.290 --> 06:14:34.680

Live Meeting: In some countries that have never been nuclear in the past, so they don't have the.

1782

06:14:35.040 --> 06:14:43.020

Live Meeting: Institutional readiness to do this, so do we need people that are experts in political science and and regulatory affairs things like that that that we need to help.

1783

06:14:43.920 --> 06:14:56.970

Live Meeting: The IAEA things like this, so there's there's I don't know that necessarily in in any remit, but there are questions that we think about more broadly, and so what can he do to.

1784

06:14:58.530 --> 06:15:05.250

Live Meeting: influence some of that to make sure that the proper workforces available both to deploy in the US and internationally.

1785

06:15:06.270 --> 06:15:15.810

Live Meeting: Sonia and unreal look at both of you contributed conversations about the workforce what's your view as to whether or not we would need to work for subcommittee.

1786

06:15:18.960 --> 06:15:23.490

Live Meeting: For it I think what Michael said, you know that that we're missing some some of the.

1787

06:15:25.080 --> 06:15:26.850

Live Meeting: You know the the skills.

1788

06:15:28.020 --> 06:15:34.740

Live Meeting: Not just the subject matter expertise, but the surrounding skills that make that subject matter expertise fly.

1789

06:15:36.090 --> 06:15:37.740

Live Meeting: And this interdisciplinary.

1790

06:15:38.790 --> 06:15:43.050

Live Meeting: At least awareness that I mentioned, I think, is also something that's.

1791

06:15:44.220 --> 06:15:45.210

Live Meeting: that's still missing.

1792

06:15:48.330 --> 06:15:50.490

Live Meeting: we're going to go back to your mouse poultry.

1793

06:15:52.950 --> 06:15:53.490

Live Meeting: and

1794

06:15:54.510 --> 06:15:55.980

Live Meeting: The chicken and egg problems.

1795

06:15:57.180 --> 06:15:59.100

Live Meeting: Yes, I think that.

1796

06:16:00.780 --> 06:16:12.480

Live Meeting: it's not just nuclear engineers that were that would be working in the growing nuclear industry but it's also social scientists in.

1797

06:16:14.070 --> 06:16:34.290

Live Meeting: printers and artists and the entire spectrum, so it goes back to communication to the public, how do we engage, how do we make nuclear an exciting field to seek a career in for everybody involved and I don't know if it's too early or too late to be having a.

1798

06:16:36.210 --> 06:16:40.950

Live Meeting: Working Group on this topic, but maybe to narrow it in a little bit.

1799

06:16:42.030 --> 06:16:50.820

Live Meeting: Going back to advanced reactor development and I guess i'm biased, since I work on advanced reactors.

1800

06:16:51.930 --> 06:16:53.160

Live Meeting: putting up that bias.

1801

06:16:54.540 --> 06:17:09.690

Live Meeting: Perhaps it would be interesting to think about workforce development for events reactors specifically including advanced directive fuel cycle, so not just reacted with everything adventure to relate it and then also.

1802

06:17:10.770 --> 06:17:16.200

Live Meeting: Thinking through innovation and what enables innovation and that's faster innovation cycle.

1803

06:17:17.910 --> 06:17:19.890

Live Meeting: Not just the next.

1804

06:17:21.420 --> 06:17:27.930

Live Meeting: yeah innovation in abroad in a broad sense, I think, so I think those are maybe tried to work first.

1805

06:17:29.400 --> 06:17:30.960

Live Meeting: That might be worth discussing.

1806

06:17:32.460 --> 06:17:34.860

Live Meeting: yeah formulate that Murray, if I.

1807

06:17:36.420 --> 06:17:40.140

Live Meeting: workforce development is is very difficult to.

1808

06:17:40.860 --> 06:17:53.700

Live Meeting: untangle that from the infrastructure, I mean after all the workforce is part of it is the human infrastructure piece of it that you're not if you don't have physical infrastructure, you won't have human infrastructure and vice versa.

1809

06:17:54.450 --> 06:18:01.050

Live Meeting: So maybe a way of looking at this, is the infrastructure needs for.

1810

06:18:02.610 --> 06:18:17.430

Live Meeting: For future of nuclear energy or what area, something that because i'm not i'm not i'm not sure that we are very well equipped to worry about the workforce development for utilities of today.

1811

06:18:18.690 --> 06:18:28.170

Live Meeting: I think we have plenty of other entities out there worrying about it and trying to take care of it, but what we are worried about is the workforce for the for the future.

1812

06:18:29.610 --> 06:18:39.420

Live Meeting: For the future, whether that's under utilities or reactor developers or whatever resonates very well tangled up into the infrastructure pieces, so my.

1813

06:18:40.230 --> 06:18:50.430

Live Meeting: My recommendation would be something along those lines so you're saying infrastructure needs for future nuclear development or cheryl deployment.

1814

06:18:53.070 --> 06:19:01.080

Live Meeting: For that event or bit more, rather than just R amp D, so it does cover the deployment, but not necessarily worry about whether or not.

1815

06:19:03.210 --> 06:19:07.950

Live Meeting: you're saying it would be more than human infrastructure your you would say that it would count.

1816

06:19:08.430 --> 06:19:15.690

Live Meeting: yeah because because I don't yeah my my my my experience has always been every time I get into that discussion is that.

1817

06:19:15.960 --> 06:19:24.600

Live Meeting: They are so they are full time together that you cannot develop the human infrastructure, without the physical infrastructure and vice versa, so what what.

1818

06:19:25.170 --> 06:19:34.470

Live Meeting: Get out of human for a minute what other infrastructure in your mind's eye if we named it that what else would you imagine would live in St research reactors.

1819

06:19:36.900 --> 06:19:46.560

Live Meeting: guess reactors and these pra facilities and i'm a little concerned about extending it to the infrastructure, just because it's it's.

1820

06:19:46.920 --> 06:19:58.980

Live Meeting: it's potentially a never ending, because then why not add transportation, why not add fuel supply, why not add you know other technical infrastructure, well then we would only need one subcommittee.

1821

06:20:05.160 --> 06:20:08.010

Live Meeting: we're looking i'm sorry to broaden it even further.

1822

06:20:10.470 --> 06:20:22.020

Live Meeting: But it seems to connect with questions of maybe the Department of Labor my seat thinking of in terms of also decommissioning, if you have communities that rely entirely on.

1823

06:20:22.890 --> 06:20:39.660

Live Meeting: The decommissioning reactor for their jobs than what How are they retrained into what industries today retraining so maybe not just workforce development but also integration with other industries or retraining.

1824

06:20:43.080 --> 06:20:50.490

Live Meeting: And if that's at all within the scope of deal of yeah we're currently calling this jobs and the energy transition.

1825

06:20:52.710 --> 06:21:07.710

Live Meeting: I still think, I still voted in favor of keeping it a little narrower I I don't disagree with the things you've mentioned Come on, in terms of the absolute necessity for things like test reactors things like this, but I still think we're going to keep it focused to a reasonable subcommittee.

1826

06:21:08.970 --> 06:21:19.890

Live Meeting: It still recommend keeping it we're in the workforce development space as a more narrow and and manageable thing I think you can decide the.

1827

06:21:20.760 --> 06:21:26.850

Live Meeting: What would potentially be necessary and just say if these things happen here's what we will need.

1828

06:21:27.690 --> 06:21:39.270

Live Meeting: To put in place So yes, you you wouldn't develop the workforce, without having infrastructure that they're going to be working at that you can postulate as everybody is postulating that we're going to have these reactors in the future.

1829

06:21:39.780 --> 06:21:45.840

Live Meeting: A lot of this is a big population right you're saying i'm going to have this big fleet that i'm building.

1830

06:21:46.860 --> 06:21:56.490

Live Meeting: If it doesn't come to fruition and we don't need to have the university programs and and other other things right so it's there, there are assumptions built into a lot of.

1831

06:21:57.870 --> 06:22:00.060

Live Meeting: The infrastructure side of in the fleet side.

1832

06:22:01.650 --> 06:22:09.840

Live Meeting: So one suggestion we could do workforce does seem to have a lot of legs and has a lot of tentacles and goes a lot of places all on its own.

1833

06:22:10.980 --> 06:22:23.610

Live Meeting: Come all to address your item we could create one that has physical infrastructure to be separate from the human infrastructure and put things in there, like the university or research reactors.

1834

06:22:25.140 --> 06:22:34.170

Live Meeting: You know, you talked about the pie facilities, other things so it's not that they're not related it just might be easier to explore them.

1835

06:22:34.530 --> 06:22:49.140

Live Meeting: Looking at physical assets, and I say physical loosely because you know could could still be modeling and stuff like that that's not exactly physical but it's just non human capital kind of things as opposed to the workforce so.

1836

06:22:50.550 --> 06:23:09.960

Live Meeting: Again let's just try this on for size, if we had a spent fuel subcommittee if we had an international competitiveness subcommittee and then we're talking workforce and i'm just going to call it physical infrastructure to differentiate it from from workforce.

1837

06:23:11.820 --> 06:23:18.690

Live Meeting: Does that feel like it covers generally the conversations that we've had today that sort of a rising to the top.

1838

06:23:20.580 --> 06:23:25.590

Live Meeting: People feel like we're missing something or do you feel like we're being too heavy and we have too many Andy.

1839

06:23:26.520 --> 06:23:36.090

Live Meeting: yeah I just like to offer a point of feedback on the US competitiveness or international competitiveness topic, you know, one of the.

1840

06:23:36.720 --> 06:23:48.330

Live Meeting: One of the themes of our engagement internationally with are like minded democracy partners is that and I think this kind of goes into.

1841

06:23:49.140 --> 06:24:00.300

Live Meeting: The discussions you've had internationally on the potential for us reactor deployment globally in that we're not pushing us technology well we're not pushing.

1842

06:24:02.730 --> 06:24:19.350

Live Meeting: The notion that we can deploy all of our reactors and everything will be fine it's that there's a potentially an insatiable appetite for us reactor technology and that we can't do it alone because we don't have the workforce.

1843

06:24:20.400 --> 06:24:25.920

Live Meeting: Today it'll take time to build it and it will require the workforce global.

1844

06:24:27.630 --> 06:24:30.900

Live Meeting: Clearly host countries would want to.

1845

06:24:32.820 --> 06:24:40.920

Live Meeting: have as many of the positions filled by their workforce it's part of their buying the US reactor technology.

1846

06:24:42.600 --> 06:24:52.500

Live Meeting: And so, so and and that there's going to be a lot of components that will need to be fabricated and provided to build that reactor to locate it wherever it's hosted.

1847

06:24:53.250 --> 06:25:04.800

Live Meeting: arm and so there's a lot of partnerships as part of the themes of our efforts to gain traction with the deployment of US reactor technology so.

1848

06:25:05.880 --> 06:25:12.570

Live Meeting: Making it about competition puts an edge on it that i'm not sure as it's going to be welcome internationally.

1849

06:25:16.140 --> 06:25:26.970

Live Meeting: Can I just pause it that one of our four priorities is called something very similar international cooperation for consideration by the committee, it starts with see we're happy with that.

1850

06:25:28.020 --> 06:25:34.470

Live Meeting: But, but you know that kind of continuing on with the intent I think here is that.

1851

06:25:36.690 --> 06:25:43.950

Live Meeting: we've got a lot of us reactor concepts that have great potential and that.

1852

06:25:45.060 --> 06:25:55.290

Live Meeting: are likely going to be deployed domestically and globally arm, and so we don't want to dampen that and and there's going to be a lot of the tides going to be lifting a lot of different boats.

1853

06:25:58.950 --> 06:26:04.050

Live Meeting: That said, you know, establishing that hundred year relationship as part of this is is also.

1854

06:26:05.520 --> 06:26:11.010

Live Meeting: going to deploy globally, are our approach for safeguards security.

1855

06:26:12.930 --> 06:26:17.340

Live Meeting: nuclear regulatory Commission is fully aware of this and they are engaging internationally with.

1856

06:26:18.450 --> 06:26:31.350

Live Meeting: The the regulators in those countries or in some of those countries where they don't have any reactors and don't really have a regulator yet they're there you know it's on their radar to engage with that country and do what they can to help.

1857

06:26:32.730 --> 06:26:34.050

Live Meeting: And so, so.

1858

06:26:35.280 --> 06:26:48.000

Live Meeting: yeah I think i've made my point but the I think the attendance is still consistent with where we're at is the idea here is the deploy global tech now our US technology globally.

1859

06:26:49.200 --> 06:26:55.890

Live Meeting: I just I want to make sure that if we say cooperate international cooperation or international partnership or things like that we don't lose sight of the fact that.

1860

06:26:56.190 --> 06:27:05.070

Live Meeting: Some of what we want to talk about is what things we do in the US to enable our industry to be competitive.

1861

06:27:05.580 --> 06:27:11.850

Live Meeting: And so that's that's a slightly different focus than just worrying about who we partner with overseas.

1862

06:27:12.150 --> 06:27:20.280

Live Meeting: Right, those are different levers that we'd be pulling in different things, we would do in the US to enable competition enabled us to to.

1863

06:27:20.820 --> 06:27:27.690

Live Meeting: Balance the playing field a little bit better right and so that's it's not all about partnering internationally I don't disagree with anything say.

1864

06:27:28.020 --> 06:27:39.930

Live Meeting: I just don't want to lose that thread in I just saying that the title of this is International Partnership yeah, I think, maybe what we'll do is just because the title has sort of so much grab.

1865

06:27:41.730 --> 06:27:52.710

Live Meeting: I would recommend that we just stay with the cooperation, but to the point you're making Mike we make a sub element of that the competitive competitiveness of the US.

1866

06:27:54.180 --> 06:28:04.590

Live Meeting: proposition, if you will, against the state owned enterprises, you know because that's that is definitely an element, but there's there's broader items, besides the competitive advantage when.

1867

06:28:04.980 --> 06:28:13.170

Live Meeting: Jamal, you were talking, it was about you know shared R amp D and sharing money, and you know that kind of stuff, so I think there are there are other elements as well.

1868

06:28:14.820 --> 06:28:19.320

Live Meeting: Alright i'm going to try this on wait a minute we didn't have to come back to to to so I told her we were going to come back.

1869

06:28:19.800 --> 06:28:32.220

Live Meeting: I think we are landing on a workforce subcommittee but it doesn't exactly scratch your itch to to because yours, was the Cross cutting items of diversity ej and workforce.

1870

06:28:33.570 --> 06:28:37.350

Live Meeting: So I guess want to come back to making sure we're addressing this.

1871

06:28:38.370 --> 06:28:50.460

Live Meeting: Item it's i'm still not sure if it's a subcommittee or if it's a presentation that we figure out if enough going on, or what we're hearing is sufficient, and we want to add additional.

1872

06:28:51.840 --> 06:29:05.400

Live Meeting: Guidance recommendation after the conversation and the subcommittee the workforce that committee, I think it might be better for us to get a good overview of activities that are going on, because it might be just a consolidate you know to.

1873

06:29:05.940 --> 06:29:15.180

Live Meeting: Take in the information that's already going on, and maybe make some recommendations so okay I be fine with that if anybody else has a different.

1874

06:29:15.780 --> 06:29:26.430

Live Meeting: point of view on that or, conversely, that I wasn't going to then we reverse what I said earlier, only based upon your point, as far as weaving longer and so.

1875

06:29:27.150 --> 06:29:37.350

Live Meeting: But somehow we need to have a discussion, but maybe that could be flushed out it out i'll tell you, for me it sounds like either an ad hoc as we're calling it an ad hoc subcommittee that.

1876

06:29:38.460 --> 06:29:48.540

Live Meeting: But I do think that maybe I don't want to recreate the wheel here until we may say it's an ad hoc subcommittee and put that as an agenda item i'm not sure.

1877

06:29:50.400 --> 06:30:01.830

Live Meeting: One of positive one of the things that you could suggest for this potential subcommittee to do would be to do a sort of fact finding mission on asking you know what.

1878

06:30:02.790 --> 06:30:14.280

Live Meeting: Getting some reports from Danny and other you know potentially do we outside of daily entities and saying, are there gaps here, that would be useful for us to help identify.

1879

06:30:15.390 --> 06:30:26.550

Live Meeting: Questions that could be answered or not, and maybe the answer that that subcommittee finds his know they're doing a great job or maybe it's yes we've identified gaps and so next step is to dig deeper.

1880

06:30:27.390 --> 06:30:37.800

Live Meeting: I like that idea, thank you for positing and putting that out there, I think fact finding and maybe a consolidation of the next meaning to present the facts that are found.

1881

06:30:39.540 --> 06:30:40.290

Live Meeting: I concur.

1882

06:30:43.110 --> 06:30:43.920

Live Meeting: Excellent.

1883

06:30:44.940 --> 06:30:46.290

Live Meeting: i'm sorry john.

1884

06:30:47.640 --> 06:30:55.590

Live Meeting: Thank you, I think, maybe one of the benefits of kind of decoupling, the work for us from the diversity and environmental justice question is.

1885

06:30:56.130 --> 06:31:01.920

Live Meeting: To allow that ad hoc committee or group to kind of focus outside of the lens of workforce why that's incredibly important.

1886

06:31:02.430 --> 06:31:06.810

Live Meeting: You know, one of the conversations that I think we heard here today, reflected from multiple voices were.

1887

06:31:07.470 --> 06:31:16.440

Live Meeting: What are the some some of the historical elements of nuclear energy, and how does that perhaps will limit future involvement in our industry moving forward and perhaps that thread could be pulled.

1888

06:31:17.160 --> 06:31:26.250

Live Meeting: A little bit more, and what are some of those narratives that we could take into account as we look for those future opportunities in this growing sector that meets a lot of challenges and.

1889

06:31:26.790 --> 06:31:33.330

Live Meeting: Where can these constituencies be engaged that might be something that would be a benefit of the decoupling of those two things.

1890

06:31:35.910 --> 06:31:40.380

Live Meeting: Excellent okay i'm going to try this on for size and then i'm going to take a negative pole so.

1891

06:31:42.090 --> 06:31:49.650

Live Meeting: subcommittees that we landed on one spent fuel to international cooperation with a sub bullet that talks about competitive advantage.

1892

06:31:50.370 --> 06:32:06.480

Live Meeting: Third, is workforce and fourth is calling it physical infrastructure for future nuclear success and does anybody not agree that those are the subcommittee's that would be worthy of i'll just say being our beginning.

1893

06:32:08.760 --> 06:32:14.820

Live Meeting: We might do others in the future, we might end up with ad hoc, but that would be sort of our first our first foray.

1894

06:32:17.340 --> 06:32:20.970

Live Meeting: Oh lake comment on special just the word.

1895

06:32:22.410 --> 06:32:38.400

Live Meeting: Is at the back end of the fuel cycle we're looking at, or is it just spent fuel meaning spent fuel, I would say that cooperates recycle, for example, Okay, and how you might put this all together empowerment Oliver and committee thing Commission things.

1896

06:32:39.450 --> 06:32:48.420

Live Meeting: that's okay with me, but I would have would have we would be with it sound better, given the people, one of the titles it's the back end that if you will cycle or leavers by field.

1897

06:32:48.960 --> 06:32:59.280

Live Meeting: I think I go either way, but I bring that up as it was originally teed up, I think it was unconcerned a sighting for radioactive waste management facilities, which includes in storage and disposal.

1898

06:32:59.640 --> 06:33:04.680

Live Meeting: I was just looking at your paper, should we should we use the he wants to know he wanted to change the title, so we have.

1899

06:33:05.070 --> 06:33:14.430

Live Meeting: The notes, I had were interim storage consent based engaging communities and the right way long term storage commercial true waste and reprocessing.

1900

06:33:15.300 --> 06:33:25.560

Live Meeting: So good to me do you want to call it, what do you want to call it envelops all they were called the back end of the fuel cycle was the Indies memo it, you know.

1901

06:33:27.690 --> 06:33:39.900

Live Meeting: The Subcommittee with with address the department's mission for implementing consent based approach for their own storage and disposal facilities for sustainable management, so I mean that that's.

1902

06:33:40.650 --> 06:33:49.050

Live Meeting: general terms and spent a few hours in short term, which is fine with me, I just wanted to make sure we all agree included, as you just said.

1903

06:33:49.890 --> 06:33:56.820

Live Meeting: yeah that's the intent was included this stuff is good, if we want a monkey with titles, we can we can have somebody.

1904

06:33:57.480 --> 06:34:03.420

Live Meeting: play with them, I didn't hear is reprocessing that in the way it was worded for so if you're talking about sustainable.

1905

06:34:03.990 --> 06:34:14.550

Live Meeting: It could, it could be, it could fold its way into the conversation as a sustainable option to be considered, but certainly you know I wouldn't put it forward any stronger than that.

1906

06:34:16.350 --> 06:34:35.730

Live Meeting: Would you suggest to the committee, that is, that is something that should be investigated under this mandate or yes, no that's a great idea sure I think it shouldn't it should not limit itself in terms of the space, I think there will be considerations, for example in these facilities.

1907

06:34:36.750 --> 06:34:38.970

Live Meeting: likes over here, Sonia and then we'll look.

1908

06:34:40.260 --> 06:34:52.800

Live Meeting: To just quickly I don't disagree with the subcommittee's we formed, so far the only thing that I am missing that we discussed was the international safeguards by design point I don't know where that would fall in the in the for.

1909

06:34:53.190 --> 06:35:02.370

Live Meeting: That you read back to us, and then the other question I had, and I just wanted that you know, maybe, maybe this is something for later.

1910

06:35:03.000 --> 06:35:19.890

Live Meeting: But if I were a member of the public, looking at the subcommittee's that are being formed I don't know if they're going to become public, but I would wonder what about climate, what about nuclear facilities in armed conflict, what about accidents and what about liability.

1911

06:35:20.910 --> 06:35:25.770

Live Meeting: Those are just some challenges that nuclear is facing, and I wonder if it would be worth.

1912

06:35:27.600 --> 06:35:30.570

Live Meeting: You know at least addressing that somehow maybe for later.

1913

06:35:32.460 --> 06:35:45.300

Live Meeting: yeah i'm i'm open if others Others feel strongly my goal wasn't that we were going to address every single item that was brought up I think we'll end up with 10 subcommittees and I think that that is.

1914

06:35:46.710 --> 06:35:53.310

Live Meeting: My personal opinion, I think we should take a bite of this we should chew on it, we should figure out where that goes and then.

1915

06:35:53.970 --> 06:36:04.890

Live Meeting: to the point, Sonia you're bringing up if it doesn't get to those items and those items continue to be on the plate, then, then we bring them up, if you want to advocate that you think those are more important than ones that we have.

1916

06:36:05.730 --> 06:36:13.470

Live Meeting: Then we can we can have that conversation I think the international safeguards one I would assume what happened in the International Committee of the ones that.

1917

06:36:14.250 --> 06:36:28.260

Live Meeting: That you listed but, but you went on, with some of them on liability and and and others, yes, I heard that conversation didn't feel to me like it rose to the level of a subcommittee doesn't mean it never will rise, but I just feel like the stuff we talked about here.

1918

06:36:29.460 --> 06:36:30.540

Live Meeting: had had sort of.

1919

06:36:32.010 --> 06:36:41.940

Live Meeting: More more conversation on it, and I was just trying to draw threads to the conversation that I heard, but this is just one person's opinion so i'm open if people feel differently.

1920

06:36:42.720 --> 06:36:58.170

Live Meeting: Do Others feel differently, do we want to die, I agree with that, I mean, I think the like liability is a subset of the competitiveness, so I think those all fit in their safety accidents those fit into, so I think it's included in that, so I support agree, he said.

1921

06:37:01.410 --> 06:37:04.140

Live Meeting: i'm Luca and then i'm gonna come to you to to you.

1922

06:37:05.190 --> 06:37:14.790

Live Meeting: I do want a second the liability point I do think it fits into the international cooperation, but there's also.

1923

06:37:15.300 --> 06:37:31.950

Live Meeting: Liability within the US and it ties in maybe to some of the cross cutting points, so I would second elevating elevating the liability are you comfortable if we put it in international and then depending on what we learned decide if there's applicability to domestic.

1924

06:37:37.620 --> 06:37:48.750

Live Meeting: i'm not sure I don't have an answer right, yes I guess it's Okay, I need more time sure sure we can begin it let's just say we could begin it in international and then, if it has a broader applicability.

1925

06:37:49.320 --> 06:37:57.720

Live Meeting: We can address them and then another piece, I did i'm not sure that i'm seeing is the front end of this appeal cycle, do we cuz yeah.

1926

06:37:59.010 --> 06:38:04.470

Live Meeting: So she's a question to these apart so first she brought up liability, she was second in what Sonia.

1927

06:38:04.770 --> 06:38:15.990

Live Meeting: had brought up we're going to ensure that liability gets covered in the international cooperation, one with an open mind that if it gets broader than that scope that it'll come back and we'll we'll address that.

1928

06:38:17.220 --> 06:38:24.300

Live Meeting: But the second point she brought up is fuel supply, so we put spent fuel as an item but not fuel supply.

1929

06:38:25.200 --> 06:38:43.110

Live Meeting: So my thought there was just there's a lot going on right now on fuel supply that this is one that we would have as an agenda item that we would hear the progress that's being made from from from do we, but maybe i'm too close to it, so let me just stop there.

1930

06:38:44.130 --> 06:38:48.390

Live Meeting: Yes, so maybe maybe we could put that into the physical infrastructure.

1931

06:38:50.940 --> 06:38:57.060

Live Meeting: I was just going to suggest the same I think about some of this infrastructure stuff is touching on supply chain.

1932

06:38:58.110 --> 06:39:09.090

Live Meeting: But I would agree with you also actually Maria that it's so dynamic and so rapidly changing that largely the old need routine updates just to keep up with how chaotic.

1933

06:39:10.020 --> 06:39:18.840

Live Meeting: It is, can I just ask about the liability I don't have the memo in front of me wouldn't there be some liability aspects to the consent Bay citing naturally.

1934

06:39:21.030 --> 06:39:26.640

Live Meeting: I don't know if it was well dressed as was an issue to address their of it was all just about just about citing yeah.

1935

06:39:27.180 --> 06:39:37.500

Live Meeting: I think pro sandy for domestic that would be domestic think price Anderson I think there is a system in place if we find it needs to be changed, will bring it up, but I think that's covered sufficiently.

1936

06:39:42.360 --> 06:39:43.260

Live Meeting: Okay tough crowd.

1937

06:39:45.180 --> 06:39:57.810

Live Meeting: and fuel international cooperation with a liability line item an international safeguards by design line item and a competitive advantage, just to name a few that will be more.

1938

06:39:58.710 --> 06:40:07.350

Live Meeting: workforce and physical infrastructure for nuclear success, a sub bullet under that is fuel supply and then sort of you know, broader.

1939

06:40:08.010 --> 06:40:22.230

Live Meeting: Broader supply chain, among others, anybody not agree to those four subcommittees again, this is just sort of our initial launch as this committee lives there might be other items that we choose to do this is just our initial footprint.

1940

06:40:23.880 --> 06:40:26.280

Live Meeting: One question is with the subcommittee's is.

1941

06:40:27.390 --> 06:40:28.590

Live Meeting: participation.

1942

06:40:30.690 --> 06:40:31.950

Live Meeting: inclusive of everyone or.

1943

06:40:32.340 --> 06:40:34.140

Live Meeting: People subject matter experts who have the.

1944

06:40:34.260 --> 06:40:47.490

Live Meeting: Interest yeah at least has it's been done before, but i'm going to defer to the dmv folks here, it would at least be a few of us that are on this main committee, but we can then bring other subject matter experts on the subcommittee's outside of who's on this.

1945

06:40:48.480 --> 06:41:00.390

Live Meeting: advisory committee, Maria these for, in addition to the consent based citing subcommittee that was in the memo in the background, with those words that can say so I can send me sighting and spent fuel pool.

1946

06:41:01.470 --> 06:41:03.570

Live Meeting: near the same as soon as we make sure.

1947

06:41:06.600 --> 06:41:08.100

Live Meeting: Alice has a carnal house.

1948

06:41:09.120 --> 06:41:13.620

Live Meeting: For these topics, like, for example, for security by design safeguards by design.

1949

06:41:14.130 --> 06:41:22.380

Live Meeting: Is it worth having a deep dive and what we're doing in that area and how we're collaborating opposite nuclear energy within our see within an essay.

1950

06:41:23.310 --> 06:41:37.200

Live Meeting: Before group start thinking about what they wanted to do as a subcommittee i'm seeing a lot of head nods so can we make that an agenda item of a future or maybe we have one of those exploratory committees, and then they bring back the results or something.

1951

06:41:43.290 --> 06:41:48.000

Live Meeting: Okay anybody not agree with where we landed on subcommittees.

1952

06:41:50.640 --> 06:41:54.690

Live Meeting: yep we're Luca Can you clarify there's also consent based citing committee.

1953

06:41:55.740 --> 06:42:05.850

Live Meeting: yeah so the consent based citing we imagined was the same as the spent fuel committee now consent by citing had some very specific, you will do.

1954

06:42:06.210 --> 06:42:12.060

Live Meeting: What i'm going to challenge the team here has spent fuel might have more than that, but you have to as a minimum, have what was.

1955

06:42:12.240 --> 06:42:23.010

Live Meeting: talked about on the consent based citing one, but we could bring in additional issues so i'm just thinking our Subcommittee actually might be broader, but as a minimum, it would answer the answer the bell on the contemporary setting.

1956

06:42:28.170 --> 06:42:34.170

Live Meeting: I would add to this so committees have historically been chaired by a member of the committee itself.

1957

06:42:36.480 --> 06:42:46.830

Live Meeting: And I believe Dr half that would be her at her pleasure in terms of who she would suggest us sharing each of these supplements, or maybe it's the chairman megawatts.

1958

06:42:47.610 --> 06:42:59.190

Live Meeting: or together you guys have it yeah, I think, from a procedural standpoint folks on this committee that are interested in being a part of these subcommittees if they are you know recommended.

1959

06:43:00.180 --> 06:43:08.670

Live Meeting: agreed upon and recommended on folks should express their interest to be a part of them and talk to half would appoint a chair of each sub committee.

1960

06:43:09.960 --> 06:43:19.350

Live Meeting: Along with the Members who express their interest and some potentially Members who are not members of the full committee.

1961

06:43:25.500 --> 06:43:27.300

Live Meeting: i've lost the agenda what's next.

1962

06:43:28.440 --> 06:43:29.220

Live Meeting: I think we got a break.

1963

06:43:30.660 --> 06:43:32.880

Live Meeting: Yes, we have reached our.

1964

06:43:34.260 --> 06:43:37.710

Live Meeting: break at 343 so that's rather close.

1965

06:43:39.090 --> 06:43:49.320

Live Meeting: We are going to keep this to a shorter break as we don't have too much left on the agenda when we come back if we can aim to be back here by.

1966

06:43:50.550 --> 06:43:56.070

Live Meeting: Or, so we will begin public comment and then closing remarks and then adjournment.

1967

06:53:11.490 --> 06:53:15.090

Live Meeting: Okay, ladies and gentlemen, if you could please return your seats.

1968

06:53:33.600 --> 06:53:37.650

Live Meeting: Okay, so we're going to go ahead and begin our public comment period.

1969

06:53:39.360 --> 06:53:55.380

Live Meeting: we're going to ask to start with folks physically in the room here if anyone would be interested in making public comments as folks to keep their remarks short, if they do have them so that we can get through, anyone who is interested so.

1970

06:53:56.640 --> 06:54:05.940

Live Meeting: Is there anybody in the physical room here that is interested in making public comment, and while you consider that possibility i'll let folks know on zoom.

1971

06:54:06.600 --> 06:54:22.170

Live Meeting: If you are interested in making a public comment you should be able to raise your hand, at which point we will be able to promote you as a panelist into the meeting to to make your comment so anybody in the room.

1972

06:54:27.270 --> 06:54:34.710

Live Meeting: yeah Jackie yes okay come on up podium is great, please introduce yourself and then.

1973

06:54:35.730 --> 06:54:41.400

Live Meeting: Sure, of course, yeah hey everyone chunky toes I met good energy collective and just really appreciate the opportunity to.

1974

06:54:42.150 --> 06:54:51.270

Live Meeting: sit in and observe today it's been fantastic to hear everyone's thoughts and remarks and really get a great snapshot from the leadership here on everything going on very helpful from the.

1975

06:54:51.660 --> 06:55:00.390

Live Meeting: Civil society and to have to receive that kind of info and you know, I just want to keep it super brief and just say really thankful and.

1976

06:55:02.160 --> 06:55:09.840

Live Meeting: interested to hear how often the concept of you know kind of social readiness work has come up and this focus on.

1977

06:55:10.320 --> 06:55:16.980

Live Meeting: kind of the social end of all the work that you're doing, I think I don't have any data to back this up, but i'm assuming that kind of.

1978

06:55:17.790 --> 06:55:25.950

Live Meeting: Part of this came up more today than it probably would have it, past advisory committee meeting so in particular really excited to hear about.

1979

06:55:26.820 --> 06:55:30.570

Live Meeting: The spent fuel and waste disposition office having hired two different folks on.

1980

06:55:30.990 --> 06:55:45.150

Live Meeting: Social scientists, I mean that's really huge and from good energy collectives perspective, we were really excited to see that the nuclear energy university program offered three different awards this past cycle on equity and ej.

1981

06:55:46.320 --> 06:55:58.080

Live Meeting: components, I think that was the first year that happened and I think President Biden just in the past hour signed the chips and science building the law and it does explicitly give do we.

1982

06:55:59.070 --> 06:56:10.620

Live Meeting: The suggestion to put some university nuclear leadership program funding towards non technical nuclear research in support of building Community confidence and participation.

1983

06:56:11.850 --> 06:56:17.610

Live Meeting: In nuclear as well as supporting some research into getting smart reactors through the licensing process so.

1984

06:56:18.570 --> 06:56:31.380

Live Meeting: All to say really good to see that becoming a little bit more entrenched in an ease focus I just briefly want to just touch on something I think Mike you mentioned today about build on operate model.

1985

06:56:32.040 --> 06:56:42.060

Live Meeting: That some reactor developers are exploring certainly okla has been very forward leaning that they expect to offer that model, I understand that I think from.

1986

06:56:43.260 --> 06:56:51.810

Live Meeting: You know Department of State, you know they understand that when they go and talk to some folks through the first Program.

1987

06:56:52.830 --> 06:57:00.990

Live Meeting: You know, part of what the US is able to offer that some competitor nations aren't is the ability to bring to bear.

1988

06:57:02.940 --> 06:57:12.840

Live Meeting: Local on the ground in those countries being able to build up the local workforces and necessary supply chains just to support these projects.

1989

06:57:13.860 --> 06:57:16.110

Live Meeting: And there's also a bit of a concern I think around.

1990

06:57:18.330 --> 06:57:32.670

Live Meeting: Making sure that those countries are able to build up the Non Proliferation apparatus themselves without relying on on us to do that and so that's all I was saying thank you great great conversation today.

1991

06:57:34.620 --> 06:57:35.430

Live Meeting: Thank you Jackie.

1992

06:57:38.370 --> 06:57:43.230

Live Meeting: anyone else in the room interested in making a public comment i'll note, as we.

1993

06:57:44.370 --> 06:57:50.730

Live Meeting: request this that folks are also welcome to submit written comments, and that should be emailed to me.

1994

06:57:52.170 --> 06:57:57.150

Live Meeting: I believe in the next 60 days, I can still accept written comment that can go into the record of this meeting.

1995

06:58:01.050 --> 06:58:02.610

Live Meeting: Oh great yep come on up.

1996

06:58:15.780 --> 06:58:16.110

Live Meeting: Hello.

1997

06:58:17.190 --> 06:58:21.600

Live Meeting: My name is a thumb I currently work at the Department of Energy any.

1998

06:58:22.770 --> 06:58:23.370

Live Meeting: Tracy.

1999

06:58:24.480 --> 06:58:35.190

Live Meeting: So I know a lot of what we talked about here is related to nuclear waste disposition, and I think, unfortunately, there are a lot of really high profile examples failure.

2000

06:58:36.330 --> 06:58:39.600

Live Meeting: unfortunate that easy example that comes to mind is the hanford site.

2001

06:58:40.560 --> 06:58:51.690

Live Meeting: Of course, do we does take that responsibility to the Community very seriously and does invest significant resources and trying to correct some of our our past failures.

2002

06:58:52.410 --> 06:59:05.130

Live Meeting: But I also think there are examples of success, and particularly some of the work that our department does with trying to make sure we meet our agreement to the Idaho settlement agreement.

2003

06:59:06.360 --> 06:59:14.100

Live Meeting: So I think trying to also emphasize some of the fact that we are capable of bringing communities into the equation and treating them with dignity.

2004

06:59:14.490 --> 06:59:22.980

Live Meeting: and making sure that nuclear waste doesn't become a huge problem for them is really important, and I think those successes stories ought to be told as well, so thank you so much.

2005

06:59:25.530 --> 06:59:26.640

Live Meeting: Thank you very much for that.

2006

06:59:28.710 --> 06:59:32.070

Live Meeting: i'm not seeing any hands raised in the zoom.

2007

06:59:38.430 --> 06:59:42.960

Live Meeting: So unless there's anyone else in the physical room.

2008

06:59:45.210 --> 06:59:51.060

Live Meeting: or unless the folks in the back, see something different than I do, on the zoom I don't think so.

2009

06:59:52.200 --> 06:59:53.490

Live Meeting: nope alright.

2010

06:59:54.900 --> 07:00:07.860

Live Meeting: we'll go ahead and close public comment, then and I will turn it back over to Dr huff and our acting chair to say thank you very much, and hopefully give us some closing remarks.

2011

07:00:09.060 --> 07:00:17.310

Live Meeting: Well, first, I just want to congratulate Maria course Nick are great pinch hitter as you're acting chair.

2012

07:00:21.660 --> 07:00:32.520

Live Meeting: I really just have been totally stunned and impressed it all the comments that I know you are wealth of information and there will be a lot more where that came from, so I really look forward to all your contributions going forward.

2013

07:00:32.910 --> 07:00:42.630

Live Meeting: These subcommittees that you selected, I think, are going to be really bound to full source of advice for us they're really nicely aligned with our priorities and I expect lots of other.

2014

07:00:43.350 --> 07:00:51.090

Live Meeting: components will be arising out of them were you know they maybe don't necessarily cover all of your interests, and I really am looking forward to it, I think the.

2015

07:00:51.540 --> 07:00:59.880

Live Meeting: Upcoming next steps will be to you know determine when your next meeting is I expect maybe it's more likely to be virtual than this meeting.

2016

07:01:00.930 --> 07:01:10.770

Live Meeting: But you know, maybe that's a topic of discussion that can be handled Procedurally, but I do just want to say it has been phenomenal being physically here with you.

2017

07:01:11.520 --> 07:01:29.760

Live Meeting: Hearing you and I know that it's a it's a big effort in these pandemic times, as well as in particular for people of your stature and expertise in this world, so thank you for your precious time and thank you for your particular pinch hitter leadership Maria but over to you.

2018

07:01:31.830 --> 07:01:40.440

Live Meeting: Thank thanks appreciate it, I think we've already jelled pretty well as the team, I think we had some great conversations throughout the day very impressed by.

2019

07:01:40.890 --> 07:01:52.050

Live Meeting: Everything that was presented by the Department of Energy and I think we're we're sort of off on a good foot, so I look forward to to further discussion use of the next one is virtual I think we enjoyed seeing each other so.

2020

07:01:52.950 --> 07:01:58.620

Live Meeting: I don't know if it has to be virtual but I look forward to seeing everybody again and.

2021

07:01:59.040 --> 07:02:11.310

Live Meeting: Safe travels home wherever home is for you thanks I don't know that it has to be virtual, but that is a reminder that I should thank Luke branscombe brava all the team here for coordinating will help coordinate in the features.

2022

07:02:16.320 --> 07:02:17.220

Live Meeting: meeting is adjourned.