DOE/IG-0552

AUDIT REPORT

COMPLETION OF K BASINS MILESTONES

APRIL 2002

U.S. DEPARTMENT OF ENERGY
OFFICE OF INSPECTOR GENERAL
OFFICE OF AUDIT SERVICES

U. S. DEPARTMENT OF ENERGY
Washington, DC 20585

March 15, 2002

MEMORANDUM FOR THE SECRETARY

FROM: Gregory H. Friedman (Signed)
Inspector General

SUBJECT: INFORMATION: Audit Report on "Completion of K Basins Milestones"

BACKGROUND

The Department of Energy (Department) has been storing 2,100 metric tons of spent nuclear fuel at the Hanford Site in southeastern Washington. The fuel, used in support of Hanford's former mission, is currently stored in canisters that are kept in two enclosed water-filled pools known as the K Basins. The K Basins represent a significant risk to the environment due to their deteriorating condition. In fact, the K East Basin, which is near the Columbia River, has leaked contaminated water into the underlying soil and groundwater.

Initiated in the early 1990s, the Department's Spent Nuclear Fuel Project is aimed at decreasing human and environmental risks by removing the spent fuel from the present storage conditions and placing it into safe, cost-effective interim dry storage until a national geologic repository is available. The spent fuel project includes removing the fuel from the canisters and cleaning and repackaging it into multi-canister overpacks. The overpacks are then transported to other Hanford facilities to dry the fuel and for interim storage.

In December 1998, the Hanford Federal Facility Agreement and Consent Order – a Tri-Party Agreement among the Department, the Environmental Protection Agency, and the State of Washington – was modified to address the current cleanup process of the K Basins. The Tri-Party Agreement, as modified, contains a number of mandatory milestones associated with removing spent fuel from the K Basins. The agreement requires the Department to remove 190 overpacks by December 31, 2002; 121 additional overpacks by December 31, 2003; and, all remaining spent fuel, a total of about 400 overpacks, by July 31, 2004.

The objective of our audit was to determine whether the Department is on schedule to meet these milestones.

RESULTS OF AUDIT

As of March 20, 2002, the Department had removed 50 overpacks – rather than the approximately 66 planned – from the K Basins. We found that persistent equipment problems and process complexities may keep the Department from ramping up to its planned full production schedule of 16 overpacks per month in early 2002. Unless these issues can be effectively overcome, performance of the Spent Nuclear Fuel Project, specifically as it relates to the milestones established in the Tri-Party Agreement, may be in jeopardy. Although the Department agreed to the milestones, its planning assumptions regarding operational processes

and equipment availability appear to have been overly optimistic. In fact, the K Basin cleanup process could take substantially longer than called for by the Tri-Party Agreement, thereby prolonging health, safety, and environmental risks associated with the K Basins' deteriorating condition.

We recommended that the Department re-evaluate its current approach to removing spent fuel from the K Basins including, if necessary as a last resort, developing a more realistic production schedule.

Our findings were consistent with conclusions reached by the Department's "Top-to-Bottom" Review Team in its recent report on *A Review of the Environmental Management Program*. With regard to the effort at the K Basins, the review team noted that at the current rate, completing spent fuel removal would take more than three years and that potential failures of key fuel-handling components pose additional risk to the schedule.

MANAGEMENT REACTION

The Manager, Richland Operations Office generally agreed with the facts presented in our report but did not agree with all of our conclusions and recommendations. The manager stated that although the K Basin schedule is aggressive, it is achievable, and he, therefore, believes that re-evaluating the Department's approach is premature. While we respect the positive nature of this position, the evidence gathered during the audit confirms that achievement of current Tri-Party Agreement milestones is at risk. Consequently, we believe that additional analysis of the schedule and challenges facing the project are warranted.

Management's comments are included in their entirety as Appendix 3.

cc: Chief of Staff
Under Secretary for Energy, Science and Environment
Assistant Secretary for Environmental Management
Manager, Richland Operations Office

COMPLETION OF K BASINS MILESTONES

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OVERVIEW

INTRODUCTION AND OBJECTIVE

The Department of Energy (Department) has been storing 2,100 metric tons of spent nuclear fuel, some of which was generated as early as the 1950s, at the Hanford Site in southeastern Washington. The fuel was used in support of Hanford's missions and is now stored in canisters that are kept in two enclosed water-filled pools known as the K Basins. Fuel stored in the K Basins exists in a degraded state.

The Richland Operations Office's Spent Nuclear Fuel Project, initiated in the early 1990s, is aimed at decreasing human and environmental risks by removing the spent fuel from the present storage conditions and placing it into safe, cost-effective interim dry storage until a national geologic repository is available. The spent fuel project includes removing the fuel from the canisters and cleaning and repackaging it into multi-canister overpacks. The overpacks are then transported to the site's Cold Vacuum Drying Facility to dry the spent fuel and then to the Canister Storage Building for interim dry storage.

In December 1998, the Hanford Federal Facility Agreement and Consent Order – a Tri-Party Agreement among the Department, the Environmental Protection Agency, and the State of Washington – was modified to address the current cleanup process of the K Basins. The Tri-Party Agreement, as modified, contains a number of enforceable milestones associated with removing spent fuel from the K Basins. Specifically, the Agreement requires the Department to remove:

- 190 overpacks by December 31, 2002;
- 121 additional overpacks by December 31, 2003; and,
- all spent fuel, a total of about 400 overpacks, by July 31, 2004.

The objective of our audit was to determine whether the Department is on schedule to meet the milestones to remove the spent fuel from the K Basins.

CONCLUSIONS AND OBSERVATIONS

Although the Department had planned to move about 66 overpacks from the K Basins to dry storage by March 20, 2002,[1] only 50 overpacks had been moved by that date. More significantly, persistent equipment problems and process complexities had kept the Department from ramping up to its planned full production schedule of 16 overpacks per month. Unless these issues can be effectively overcome,

[1]This is the latest date for which complete information was available at the conclusion of our audit.

the Department will not meet any of the milestones established in the Tri-Party Agreement relating to the cleanup of the K Basins. Although the Department agreed to the milestones, its plan for cleanup of the K Basins was not adequate to ensure that the deadlines would be met. As a result, the K Basin cleanup process could take substantially longer than called for by the Tri-Party Agreement, thereby prolonging health, safety, and environmental risks associated with the K Basins' deteriorating condition.

We recommended that the Department re-evaluate its production schedule and, as required, amend it to reflect achievable production levels.

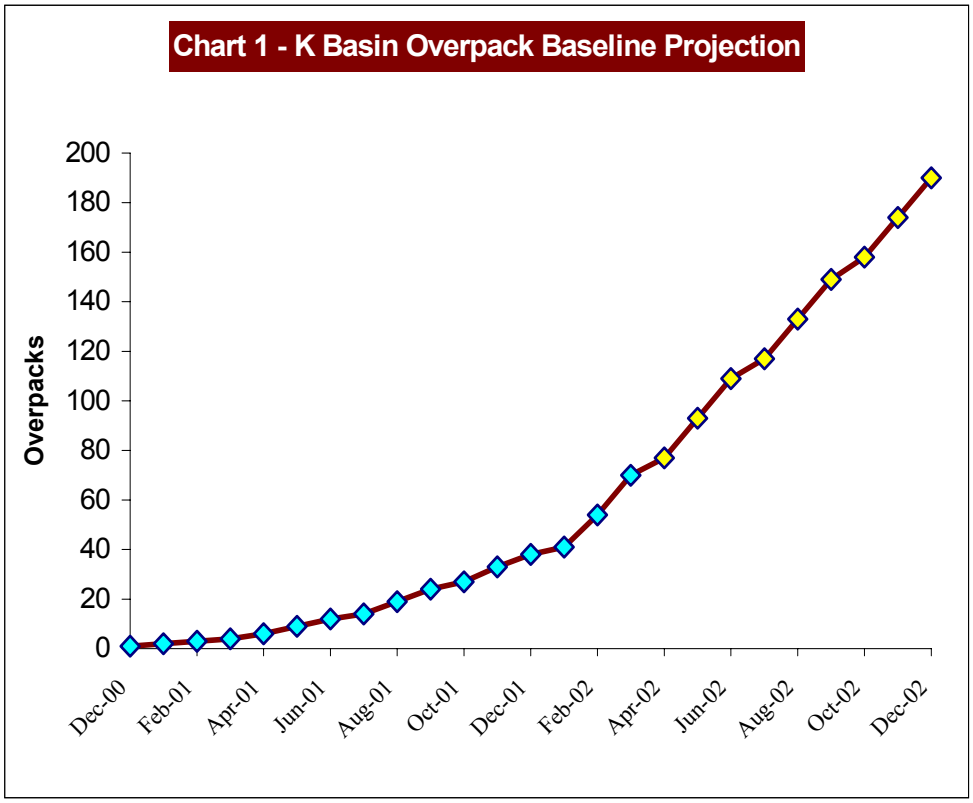
The audit identified weaknesses that management should consider when preparing its yearend assurance memorandum on internal controls.

(Signed)
Office of Inspector General

ENFORCEABLE MILESTONES AT RISK

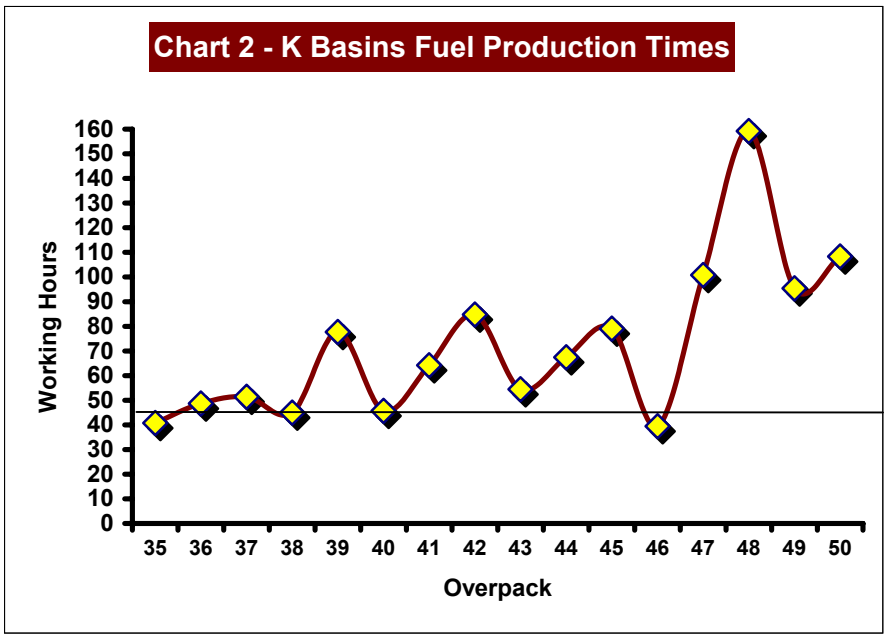
Progress To Date

The Department is in jeopardy of missing milestones in the Tri-Party Agreement associated with the removal of fuel from the K Basins. As of March 20, 2002, 50 overpacks had been moved to dry storage although the Department had planned to move about 66 by that date. According to its July 2001 baseline, the Department planned to gradually increase the number of overpacks completed each month during the first year of operations. During that first year (2001), between three and six overpacks were completed each month. Beginning in early 2002, however, the Department intended to ramp up to a more aggressive "full production" schedule of about 16 overpacks per month. The planned ramp-up is illustrated in the following graph.



A key process change in support of the full production schedule was the implementation of a 24-hour a day, 7-day a week (24/7) schedule. Although the new 24/7 schedule began in January, the Department had been unable to achieve its full production schedule of 16 overpacks as of March 2002. In fact, only six overpacks were expected to be completed in March.

In order for the Department to meet its full production targets, it must be able to process a single overpack in about 45 working hours. Data provided to the Office of Inspector General by the Department's responsible contractor showed that only about a third of the overpacks processed so far had been completed in less than 50 working hours. About another third had taken 90 hours or more each – double the time that must be regularly achieved if the Department is to keep to its schedule. By the contractor's calculation, the current average processing time is about 72 hours. Processing times for each of the next 16 overpacks[2] moved are illustrated in the following graph.



As the graph illustrates, the Department continues to experience wide fluctuations in processing times. Department managers attributed the fluctuations to a number of causes, including frequent equipment breakdowns. There are also significant variations in the degree of degradation of individual fuel assemblies. Assemblies that are more degraded require the use of specialized equipment, introduce additional complexity to the processing cycle, and generally take longer to remove than assemblies that are in better condition. On this point, it is important to note that the 50 overpacks completed as of March 20, 2002, have all come from the K West Basin. According to Department and contractor officials we spoke to, assemblies in this basin tend to be in better condition than those in the K East Basin. Thus, assemblies in the K East Basin would, potentially, require more processing time.

[2]Processing times for the first 34 overpacks also varied widely. However, they are not included in the chart because times were calculated using slightly different assumptions. Thus, times for the first 34 are not fully comparable to the next 16.

In response to a draft of this report, the Manager of the Richland Operations Office stated that while the current overpack production rate is lower than desired, it is reasonable to expect improvement in this rate. The Manager's response indicated that equipment failures responsible for the lower than expected delivery rate for February 2002 are being repaired and design changes implemented to prevent recurrence of the failures. In addition, the Department recently completed a "single failure analysis" of the entire production process. According to the Manager, this process identifies potential future equipment failures as well as approaches to overcoming them. He expects these actions to improve the K Basins process substantially.

We support the Department's actions as described in management's comments, but because they occurred after we completed our audit fieldwork, we did not fully assess them. Our primary concern was, and remains, that to date the contractor has been unable to consistently process overpacks within the timeframe required to meet the enforceable milestones.

Enforceable Milestones

The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) requires that federal facilities enter into agreements that govern the cleanup process. The Tri-Party Agreement establishes the framework for implementing CERCLA requirements and includes enforceable milestones for the removal of K Basins spent fuel. Enforceable milestones are defined as those milestones that if not complied with by the parties, are subject to civil penalties. Prudent project management principles, contained in DOE Order 413.3, ensure that projects are completed on schedule and are fully capable of meeting mission performance. The principles dictate that performance criteria and operational readiness should be known and verified prior to operations.

Planning Considerations

Achievement of the Tri-Party Agreement's milestones was jeopardized because the Department's plan for cleanup of the K Basins was not adequate to ensure that the deadlines would be met. Specifically, the Department agreed to the milestones before completing construction of required facilities, without a full understanding of new technologies that would be employed, and without a realistic processing schedule. In essence, the Department's planning assumptions were overly optimistic.

At the time the Tri-Party Agreement was modified to incorporate K Basin milestones, construction work on the Fuel Retrieval System and the Cold Vacuum Drying Facility had not been completed. The Fuel Retrieval System, which is designed to retrieve, clean and load the spent fuel into the overpacks, was not completed until

September 1999, or 9 months after the Tri-Party Agreement was modified. Construction of the Cold Vacuum Drying Facility was not substantially complete until October 1999 – 10 months after the Tri-Party Agreement was modified. Thus, the Department was unable to establish production capabilities for these facilities until well after deadlines had been established.

Not only were these facilities not fully constructed, they were also based on technologies that had not been fully proven. Predicted times for fuel retrieval and drying were based solely on estimates of processes and technologies that had never been performed. Once the required facilities were constructed and operational, the Department learned that actual processing times were longer than anticipated.

Potential Risks

In light of the uncertainties associated with the new facilities and technologies employed at the K Basins, the Department had not demonstrated a realistic schedule for removing the required number of overpacks in accordance with the Tri-Party Agreement. Although the 24/7 approach was implemented to increase output to the full production level, this approach, by itself, did not appear sufficient to ensure that enforceable milestones would be met. The 24/7 approach will only result in the processing of 16 overpacks per month if each one can be processed in about 45 hours. As noted, the Department has not yet proved that this can be achieved and is averaging about 70 hours per overpack. The Department's planned schedule, therefore, appears to be inconsistent with available technology, processing capabilities, or both. The schedule also does not appear to allow sufficient time for equipment breakdowns. In this regard, we noted that several such breakdowns occurred in the first year of operation, each of which led to significant down time.

As a result, the K Basin cleanup process could take substantially longer than called for by the Tri-Party Agreement, thereby prolonging health, safety, and environmental risks associated with the K Basins' deteriorating condition. These risks are well known and include the fact that the K East Basin, which is located near the Columbia River, has leaked contaminated water into the underlying soil and groundwater.

Additionally, the Department is subject to fines of $5,000 for the first week and $10,000 thereafter for missing the enforceable milestones dates. At its current production rate, the Department will miss the first enforceable milestone by 169 weeks and could be liable for a fine of up to $1.69 million. Likewise, at the current average removal rate, removing all 400 overpacks will take an additional seven years. This

could result in total fines of about $3.6 million. Further, the Department could face public criticism and increased operating expenses for missing milestones.

RECOMMENDATIONS

We recommend that the Manager, Richland Operations Office:

1. Re-evaluate the feasibility of increasing the average number of overpacks removed each month;

2. Develop a realistic production schedule based on current production levels and any possible process improvements; and,

3. If necessary, attempt to renegotiate enforceable milestone dates with the Environmental Protection Agency and the State of Washington for removal of spent nuclear fuel from the K Basins.

MANAGEMENT REACTION

In his comments on our draft report, the Manager, Richland Operations Office agreed, in general, with the facts presented, but did not agree with all of our conclusions and recommendations. The Manager was particularly concerned that the draft did not adequately reflect the Department's baseline schedule for overpack processing, which allowed for a gradual ramp-up during the first year of operations. We have revised the text to more fully recognize that ramp-up phase.

Management partially concurred with the first recommendation, but indicated that with only limited experience in the project's increased production phase, it was premature to re-evaluate the feasibility of increasing the overpack removal rate.

Management did not concur with recommendation 2 because it believes that the current schedule, while aggressive, is achievable. With regard to recommendation 3, the Manager stated that if at some point the Department concludes that the end-date Tri-Party Agreement milestone is no longer feasible, it would initiate discussions with the Environmental Protection Agency and the State of Washington at that time.

The Manager's comments are included in their entirety as Appendix 3.

AUDITOR COMMENTS

We appreciate management's commitment to achieving the Spent Nuclear Fuel Project's objectives in accordance with milestones identified in the Tri-Party Agreement. Based on our audit, however, we have concluded that meeting those milestones will be problematic unless the Department can overcome equipment failures and process impediments in the very near future. In this context, a re-evaluation of the current processing schedule is, in our judgment, a prudent management action at this time.

Appendix 1

SCOPE

We performed the audit from April 17, 2001, through March 20, 2002, at the Department's Richland Operations Office and Fluor Hanford, Inc (Fluor). The scope included the Spent Nuclear Fuel Project milestones in the December 1998 revision of the Tri-Party Agreement as well as past and present production schedules for processing spent nuclear fuel at Hanford.

METHODOLOGY

To accomplish the audit objective, we:

- Reviewed prior audit reports to identify concerns related to K Basin spent fuel;
- Reviewed applicable federal laws, regulations, Department Orders, and internal policies and procedures;
- Reviewed Fluor's February 2001 Processing Comprehensive Plan Summary;
- Reviewed the Fiscal Year (FY) 1997 to FY 2004 Project Baseline budget;
- Toured the K West Basin and Cold Vacuum Drying Facility; and,
- Analyzed the Department's spent fuel removal process.

We conducted the audit according to generally accepted Government auditing standards for performance audits, and included tests of internal controls and compliance with laws and regulations to the extent necessary to satisfy the audit objective. Internal controls reviewed included Department and contractor policies and procedures and Federal regulations related to management and operation of the Spent Nuclear Fuel Project. We assessed the significant internal controls and performance measures established under the *Government Performance and Results Act of 1993* related to the Spent Nuclear Fuel Project's management and operation. The Department had established reasonable performance measures and incentive fees for each enforceable milestone to remove spent fuel. Because we limited our review, it would not necessarily have disclosed all internal control deficiencies that may have existed at the time of our audit. We did not conduct a reliability assessment of computer-processed data because only a very limited amount of such data was used during the audit.

An exit conference was held with representatives from the Office of Environmental Management and the Richland Operations Office on April 1, 2002.

Appendix 2

RELATED OFFICE OF INSPECTOR GENERAL AND GENERAL ACCOUNTING OFFICE REPORTS

- *Remediation and Closure of the Miamisburg Environmental Management Project (DOE/IG-0501, May 2001)*. The remediation and closure of the Miamisburg Environmental Management Project was not on schedule. The commitment to close the site will not be met because a completion date was set without knowing whether it was achievable and a valid baseline was not developed to effectively manage the project.

- *Americium/Curium Vitrification Project at the Savannah River Site (DOE/IG-0489, November 2000)*. The audit found that the Department will not meet its current commitment to stabilize Americium/Curium because it made commitments before knowing if they were achievable and did not establish a continuous level of funding necessary to complete the project on time.

- *The Management of Tank Waste Remediation at the Hanford Site (DOE/IG-0456, January 2000)*. Key project management components have yet to be developed and implemented to control the cost, schedule, and technical direction of the project. The milestone schedule was established before the technical scope was determined for the project.

- *Department of Energy's Hanford Spent Nuclear Fuel Storage Project – Cost, Schedule, and Management Issues (GAO/RCED-99-267, September 1999)*. GAO found that the project schedule and budget has continued to increase, problems have made meeting the project goals uncertain, and weaknesses exist in the management and oversight of the project.

- *Management Problems at the Department of Energy Hanford Spent Nuclear Fuel Storage Project (GAO/T-RCED-98-119, May 1998)*. GAO found that the deteriorating spent fuel and storage basins may become unsafe, the project was behind schedule and over budget, unrealistic schedules and inadequate management contributed to project difficulties, and recent changes to the project may not stop the cost and schedule growth.

- *Department of Energy's Project to Clean Up Pit 9 at Idaho Falls is Experiencing Problems (GAO/RCED-97-180, July 1997)*. The Department agreed to an enforceable deadline (milestone) for retrieving and processing the waste from the Idaho Falls Site Pit 9 by February 1999. However, the contractor estimated that it would not be able to complete the project until April 2001. The deadline was agreed upon even though the proposed system had never been tested in a full-scale operation.

- *National Priorities Needed for Meeting Environmental Agreements (GAO/RCED-95-1, March 1995)*. GAO found that the Department entered into unrealistic agreements that were made without knowing whether the cleanup tasks were technically feasible.

Appendix 3

RL-F-1325.6 (02/98)

United States Government **Department of Energy**

memorandum **Richland Operations Office**

DATE: MAR 1 3 2002

REPLY TO ATTN OF: A&E:VAM/02-A&E-0045

SUBJECT: DOE RICHLAND OPERATIONS OFFICE (RL) COMMENTS ON OFFICE OF INSPECTOR GENERAL (OIG) DRAFT AUDIT REPORT ENTITLED "COMPLETION OF K BASINS MILESTONES"

TO: F. D. Doggett, Deputy Assistant Inspector General for Audit Services
Office of Inspector General, IG-30, HQ

Thank you for the opportunity to comment on the OIG draft report "Completion of K Basins Milestones," which was received by our office on February 20, 2002. Your draft report recommends that RL take action to: (1) re-evaluate the feasibility of increasing the average number of overpacks removed each month; (2) develop a realistic production schedule based on current production levels; and (3) if necessary, attempt to renegotiate enforceable milestone dates with the Environmental Protection Agency and the State of Washington for removal of spent nuclear fuel (SNF) from the K Basins.

We agree in general with the overall facts presented in the draft report; however, we do not agree with all the conclusions or recommendations reached by the OIG. Let me address your recommendations individually:

- We "partially concur" in your first recommendation. Our project baseline for SNF movement targets no more that 6 Multi Canister Overpacks (MCO) per month through February, the same month the OIG report was received. Around the clock operations to move SNF began in January, one month ahead of schedule, providing an opportunity to accelerate the amount of SNF from the K-Basin over project baselines. Unfortunately, unforeseen equipment reliability and operational issues offset our planned schedule acceleration during the month of February. We recognize that meeting the 16 overpacks per month goal is very aggressive, but still believe it is possible and intend every effort to achieve it. In short, since we are still in the first month of increased production, we consider it premature to reevaluate the feasibility of increasing our overpack removal rate.

- We do not concur with your second recommendation for the same reason. We think the production schedule is achievable based on experience to date and forecasted improvements in equipment reliability and operability and personnel proficiency.

- Finally, we do not support renegotiating the major end-date milestones in the Tri-Party Agreement (TPA). We have always acknowledged that the schedule is aggressive, but believe that from a contract management and risk reduction standpoint, those end-date milestones should still be retained. If at some point we were to conclude that meeting the end-date TPA milestone is no longer feasible, we would in fact initiate discussions with the Environmental Protection Agency and The State of Washington at that time.

The SNF Project is focused on addressing a major safety and environmental risk at Hanford. The schedule to move spent fuel and achieve Tri-Party Agreement milestones was therefore designed to be aggressive. This project is regarded as a "first of a kind" project, and many lessons continue to be learned while we move forward. We have, and will continue to, overcome issues as they surface with the project. Additional, more detailed, information and responses to the report are contained in the attachment to this memorandum.

If you have any questions, you may contact me, or Michael Schlender, Deputy Manager for Site Transition, or your staff may contact Steve Veitenheimer, RL Office of Spent Nuclear Fuels, on (509) 373-9725.

Keith A. Klein
Manager

Attachment

cc w/attach:
M. R. Kuklok, IG-357
M. A. Nielson, EM-40
J. H. Roberson, EM-1
S. A. Rudzinski, EM-13
R. Won, EM-43

**RL'S DETAILED COMMENTS TO DRAFT
OIG REPORT – SNF PROJECT**

"Enforceable Milestones at Risk -Progress to Date"

1. Page 3, first paragraph: "The Department averaged about 3 overpacks per month, and never processed more than 6 in a month."

   This is true; however, the baseline schedule for the SNF Project has not scheduled removal of more than six Multi-Canister Overpacks (MCOs) in any month through January 2002. In fact, at the end of January, the Project was actually two MCOs ahead of the baseline schedule.

   During January, the Project initiated 24-hour a day operation on a 7-day per week basis, increasing from a 16-hour a day operation on a 5-day per week basis. February 2002 was forecast to be the initial month to reflect a higher MCO production rate (12 MCOs in the February baseline), based solely on a doubling of available MCO production time. However, recovery from an off-normal occurrence and equipment problems at the K Basins stopped production for nearly three weeks. Only 3 MCOs were removed versus the 12 MCOs planned.

   The baseline schedule reflects a "full production" rate of approximately 16 MCOs per month, except when quarterly maintenance outages are scheduled. Only 8 MCOs are scheduled for removal during months with planned quarterly outages. Confidence in achievement of the 16 MCO per month production rate is based on improvements currently implemented or being implemented. Many of these are identified in a separate section below.

2. Page 3, second paragraph: "Recognizing the need to accelerate the packaging and removal process, the Department adjusted its approach in January 2002 by implementing a 24-hour a day, 7-day a week (24/7) schedule at the K Basins."

   During January 2002, the SNF Project did transition to 24/7 MCO production operation in the K Basin. However, it was not an "adjustment in approach." The Project has planned to go to 24/7 fuel removal operations and this is reflected in the Project baseline plan and schedule.

3. Page 3, second paragraph: "We noted that only 4 overpacks were moved in January and that significant impediments to faster processing had not been fully addressed."

   As noted above, the Project did transition to 24/7 MCO production operation; however, no increase in production rate was expected or scheduled into the baseline. It was always planned to have a transition period where work crews would adjust to working 24/7 rotating shifts, and a significant number of newly qualified operators completed training and

developed a familiarity with actual fuel removal operations. In addition, a scheduled quarterly maintenance outage occurred during January, during which no MCO production occurred (or was scheduled).

4. Page 3, second paragraph: "Unless these (equipment issues) and other similar issues can be resolved, the Department is unlikely to meet its 16 overpack per month goal."

   Equipment reliability has been one of the major challenges for this Project to overcome, but we have overcome all equipment problems experienced to date and fully expect this to continue. Efforts to transition from responding to equipment breakdowns and to getting more proactive are well underway. A "single failure analysis" of the entire MCO production process has been performed, identifying potential future failures that may impact production. The need for design changes, purchase of extra spare equipment and advance development of repair packages have been identified, prioritized, and are being implemented. A more detailed description of other process improvements is identified in a separate section below.

   As stated above, the 16 overpack per month goal is an average and is not planned for months that contain a quarterly maintenance outage.

"Enforceable Milestones"

1. Page 3, first paragraph: "Prudent project management principles, contained in DOE O 413.3, ensure that projects are completed on schedule and are fully capable of meeting mission performance."

   We believe that prudent project management principles have been applied to this project, considering its "one-of-a-kind" nature. The best example is the baseline production schedule. This schedule has reflected a slow ramp-up of production over the first year of operation. The initial three months of production only scheduled one MCO removal per month. As the process has developed greater experience, increased production was scheduled, and accomplished. As stated earlier, full production was scheduled to begin during February 2002 (12 MCOs scheduled) and March 2002 (16 MCOs scheduled).

Planning Considerations

1. Page 3, first paragraph: "Specifically, the Department agreed to the milestones before completing construction of required facilities, without a full understanding of new technologies that would be employed, and without a realistic processing schedule."

   TPA milestones are established through negotiations between the DOE and the Regulators based on best available information at the time. The process allows for renegotiation should there be a significant change in the assumptions that serve as a basis for the milestones. Specifically, for the SNF Project, a major renegotiation/revision of TPA milestones occurred during 2001 to reflect a significant revision to the Project technical strategy. This was accomplished without subjecting the Project to regulatory penalties.

2. Page 4, first full paragraph: "The first overpack processed, in December 2000, took 278 work hours to complete."

   The DOE fully expected that the first MCO would take at least this long because this was the first time that the processing equipment, procedures, and operators went through the entire MCO process with spent fuel. Time for this was built into the schedule. The Project had planned on removing only one MCO per month for the initial three months of operation.

3. Page 4, second full paragraph: "As noted, the Department has not yet demonstrated that this can be achieved and is averaging 70 hours per overpack."

   Although the current MCO production rate is lower than expected, 68.7 working hours per MCO, it is unreasonable to expect no improvement to occur in the MCO delivery rate of K Basins. The equipment failures that have driven the lower than expected delivery rate for February 2002 are in the process of being repaired and design changes implemented to prevent recurrence of the failures. These actions alone will improve the MCO delivery rate of the K Basins process substantially. See section below addressing process improvements.

PRODUCTION IMPROVEMENTS

Completed actions include:

1. Redesign of the MCO Loading System (MLS) software control to improve interlock operability/reliability and provide the capability to perform all required functions without the need to bypass any interlocks thereby improving overall system equipment safety.

2. Redesign of the electrical power cabling supplying electrical power to the many small hoists used in the process. Undersized electrical power cables had been the source of the apparent hoist failures that had delayed the process on several occasions.

In addition, several other design/equipment operation/personnel qualification improvements are being investigated that, if realized, will increase K Basins MCO delivery rate even further.

1. A modification to the Integrated Water Treatment System (IWTS) design is being evaluated that will provide for greater functionality of the underwater pumps by providing for the capability to manually balance system flow through use of control valves on the outlet of the underwater pumps.

2. An IWTS system operation change is being investigated which would substantially increase the water flow during Backwash and Top Sparge operations, making these operations more effective and greatly reducing the production time being spent performing these necessary functions.

3. In parallel with the IWTS system operations change in 2 above, a possible IWTS design change is being investigated that would add a small Backwash/Top Sparge booster pump to the system to increase the water flow rate during these necessary operations.

4. Improvements in personnel qualification and in the numbers of qualified personnel are in progress. Once these improvements are realized (expected by mid-April) the shift crews will have sufficient qualified personnel to continue to operate the systems during meal times and shift turnover times. This improvement in work efficiency is expected to eliminate the 4.5 hours lost to meal times and shift turnovers each working day. This improvement constitutes a 17 percent increase in the available production hours for each working day, and a corresponding increase in productivity is expected.

Potential Risks

1. Page 4, first paragraph: "Likewise, at the current average removal rate, removing all 400 overpacks will take an additional 7 years."

   While RL believes that the identified potential fine is extreme, under the existing contract with FHI, any fines resulting from missing Tri-Party Agreement milestones can be passed on to the contractor at a rate of up to $10K/week. The entire fine could be "covered" through a reduction in the contractor performance fee pool.

   The major monetary impact associated with not meeting the baseline schedule and thus missing Tri-Party Agreement milestones will be a significant increase to the SNF Project life-cycle cost. This would be the result of maintaining all of the Project personnel and systems necessary to maintain the K Basins as nuclear facilities and to maintain the capability to move spent fuel beyond FY 2004. This is precisely why RL wants to keep the current aggressive baseline schedule and keep the pressure on to remove this risk.

Recommendations

1. "Re-evaluate the feasibility of increasing the average number of overpacks removed each month."

   PARTIALLY CONCUR - RL believes that we have already re-evaluated the existing baseline schedule for removal of MCOs from the K Basins and believe it to be challenging, but achievable. The average number of MCOs processed each month is expected to rise significantly over the next several months. This is mainly affected by increasing the number of MCO "production hours" each week from 80 hours per week to over 160 hours per week. In addition, identified production improvements have been/are being implemented that will achieve additional production.

2. "Develop a realistic production schedule based on current production levels and any possible process improvements."

   NONCONCUR - RL believes that the SNF Project schedule is realistic. This schedule has reflected a slow ramp-up of production over the first year of operation. The initial three months of production only scheduled one MCO removal per month. As the process has developed greater experience, increased production was scheduled and accomplished. During January, the Project initiated 24-hour a day operation on a 7-day per week basis, increasing from a 16-hour a day operation on a 5-day per week basis. February 2002 was forecast to be the initial month to reflect a higher MCO production rate (12 MCOs in the February baseline), based solely on a doubling of available MCO production time. However, recovery from an off-normal occurrence and equipment problems at the K Basins stopped production for most of the month. Only 3 MCOs were removed versus the 12 MCOs planned.

   The baseline schedule reflects a "full production" rate of approximately 16 MCOs per month, except when quarterly maintenance outages are scheduled. Only 8 MCOs are scheduled for removal during months with planned quarterly outages. Confidence in achievement of the 16 MCO per month production rate is based on improvements currently implemented or being implemented.

   RL strongly believes that recent actions taken to improve equipment reliability coupled with actions being evaluated to further improve equipment reliability, equipment operability, and personnel efficiency can result in improving the MCO delivery rate sufficiently to regain the baseline schedule and meet all enforceable TPA milestones with respect to MCO deliveries.

3. "If necessary, attempt to renegotiate enforceable milestone dates with the Environmental Protection Agency and the State of Washington for removal of SNF from the K Basins."

   CONCUR – RL agrees that, if necessary, we will attempt to renegotiate Tri-Party Agreement milestones for removal of SNF from the K Basins; however, at the current time, we feel that the project schedule is realistic. The schedule was designed to be aggressive and consistent with EM-wide efforts to challenge the status quo and implement contract and management reforms. As stated earlier in this attachment, a major renegotiation of SNF Tri-Party Agreement milestones occurred during 2001 to reflect significant revisions to the project technical strategy. We will continue to assess our ability to meet the current milestones.

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