Uranium Processing Facility (UPF) Application of Lessons Learned

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PRES-PM-801768-A095

2010 Department of Energy Project Management Workshop

March 9 - 10, 2010, Alexandria, VA

"Meeting The Challenge"

U.S. DEPARTMENT OF ENERGY

- Concerns
- Summary
- UPF Lesson Learned Process
- Examples
- Metrics
- Close & Questions

Discussion Points

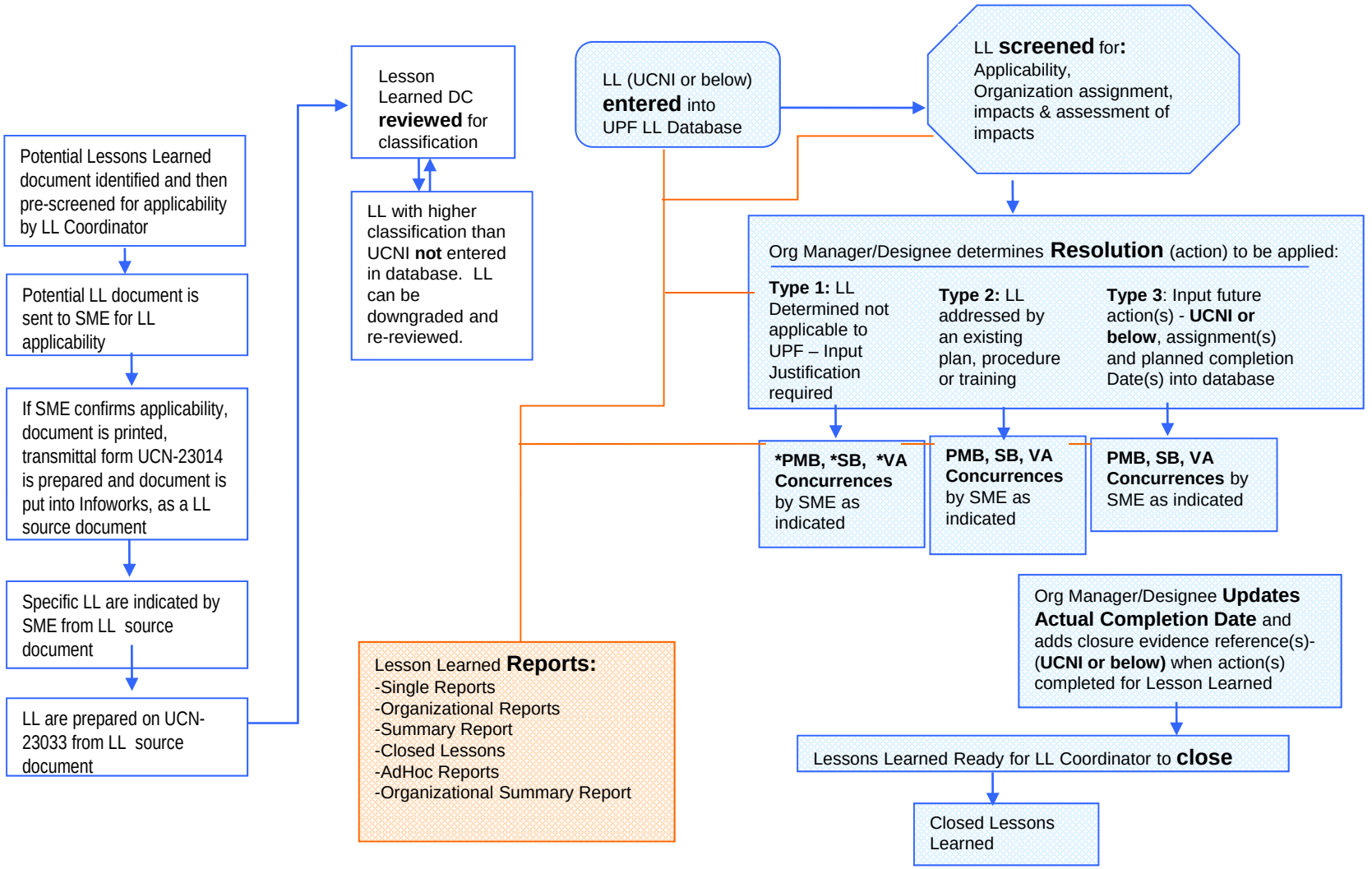
- Existing process was not effective in either identification, tracking, or closure of lessons and issues
- M&O not responsive to assessing lessons learned
- Direction given for the M&O to develop and put in place a responsive and complete lessons learned process that would provide the following:
  - Timely identification and assignment to responsible manager
  - Provide clear expectations and responsibilities
  - Evaluate issues and correlate with other systems and data for similarities
  - Track issue through assessment, application to UPF and closure
  - Life of project requirement

UPF Lessons Learned Process – Concerns

- UPF is actively seeking lessons through contact with other projects including manager site visits to understand relative issues.
- UPF interacts with 9212, HEUMF, AWE, WTP, SRS, and other projects outside DOE to share operating experiences and Lessons Learned.
- Project management has instituted a monthly Quality/LL meeting that reviews LL metrics and reviews details of selected lessons learned with the responsible individuals.
- Some Best Practices: Fully integrated EPC approach, InfoWorks, Lessons Learn Program, Requirements Management Database

- Implementing Procedure, Y15-95-331
- Lessons Learned process uses an Oracle database
- Example Sources of UPF Lessons Learned:
  - -Meeting minutes from Plant & Project LL meetings
  - -LL reports from HEUMF and discipline specific briefings
  - -NOV's and causal analysis from sites such as MOX, SRS, WTP
  - -Trip Reports from site visits (Pueblo Chemical Demil, MOX, WTP Vendor Commercial Grade Dedication Process)
  - -Y12 Conduct of Quality Initiative & causal analysis
  - -DOE National LL database
  - -Y12 Projects Division LL Reports at Project closeout
  - -Off project design review by Plant functional managers & SME's

UPF Lesson Learned Process



* PMB: Performance Baseline *SB: Safety Basis *VA: Vulnerability Assessment

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UPF Lessons Learned Process Flowchart

- One of a kind unique, large and complex project
- Assessments, reviews, visits, and briefings
- Funding issues and challenges
- Resources (both federal and contractor)
- M&O contract versus management of large projects
- Processes and software systems inadequate
- Identification of design issues early
- Planning for construction during design
- Configuration management

Lessons Learned

A Lesson Learned issue selected for UPF Construction from RP-PJ-972082-AOO I, Rev 3:

2.1.2 Installation Issues Discovered Before Project Shutdown

During January 2006, several issues were identified relative to incorrect installation of reinforcing steel by the subcontractor. The first issue was the discovery that wall dowels in the slab-on-grade concrete pours were shorter than required by the design. The dowels were fabricated and installed in accordance with reinforcing steel shop drawings. However, the shop drawings did not accurately incorporate the required dowel projection defined in the structural drawing.

Shortly thereafter, it was discovered that vertical wall-slab connection u-bars in the top lift of four wall placements (of a total length of approximately 80 ft) were missing.

The Lesson Learned Extracted (FY08-00012)

CAPS Issue No.: 1-53598 / CAPS Reference No.: NA--YSO-BWXT-Y12NUCLEAR-2006-0005

- "During the discussion of the inspection process, it was determined that during the final inspection process, the applicable drawings are not always "in hand" when the inspection is being done."
- "The inconsistent use of the proper supporting documents indicates a less than adequate inspection process and was identified as causal factor A2B3C02 – Equipment / Material Problem – Inspection / Testing LTA."
- "Often shop drawings were used; however, when shop drawings were used, the "mark-up" copy used in the field was not maintained with the completed Form 2."
- "XXXXXXX, Inc. (another subcontractor to XXXX) employed a third dedicated quality control representative to inspect reinforcing steel as it progresses for conformance to the approved shop drawings and the design documents.

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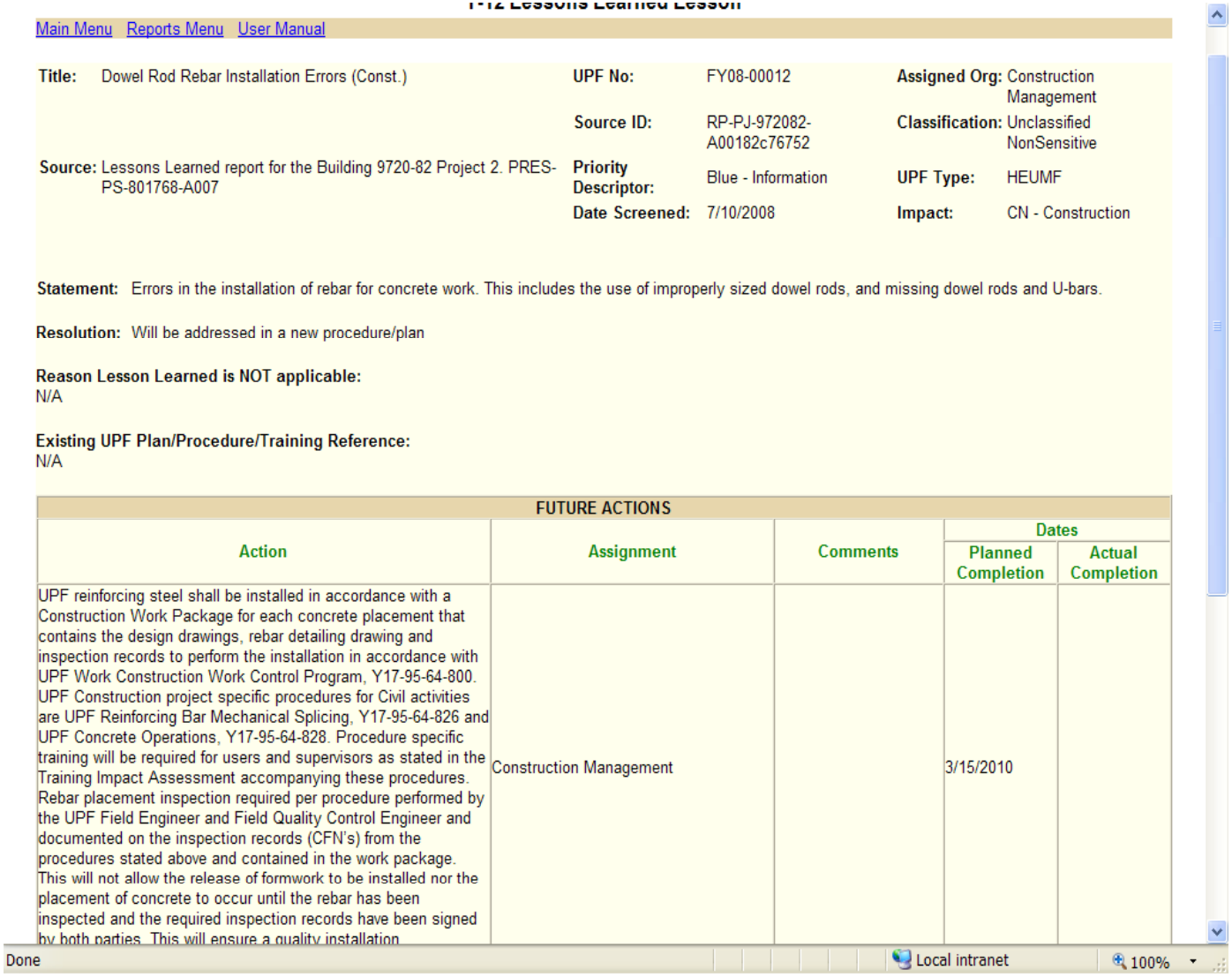
Causal Analysis Statements for FY08-00012



Main Menu Reports Menu User Manual

Title: Dowel Rod Rebar Installation Errors (Const.)

UPF No: FY08-00012

Assigned Org: Construction Management

Source ID: RP-PJ-972082-A00182c76752

Classification: Unclassified NonSensitive

Source: Lessons Learned report for the Building 9720-82 Project 2. PRES-PS-801768-A007

Priority Descriptor: Blue - Information

UPF Type: HEUMF

Date Screened: 7/10/2008

Impact: CN - Construction

Statement: Errors in the installation of rebar for concrete work. This includes the use of improperly sized dowel rods, and missing dowel rods and U-bars.

Resolution: Will be addressed in a new procedure/plan

Reason Lesson Learned is NOT applicable:
N/A

Existing UPF Plan/Procedure/Training Reference:
N/A

FUTURE ACTIONS

Action	Assignment	Comments	Dates	
			Planned Completion	Actual Completion
UPF reinforcing steel shall be installed in accordance with a Construction Work Package for each concrete placement that contains the design drawings, rebar detailing drawing and inspection records to perform the installation in accordance with UPF Work Construction Work Control Program, Y17-95-64-800. UPF Construction project specific procedures for Civil activities are UPF Reinforcing Bar Mechanical Splicing, Y17-95-64-826 and UPF Concrete Operations, Y17-95-64-828. Procedure specific training will be required for users and supervisors as stated in the Training Impact Assessment accompanying these procedures. Rebar placement inspection required per procedure performed by the UPF Field Engineer and Field Quality Control Engineer and documented on the inspection records (CFN's) from the procedures stated above and contained in the work package. This will not allow the release of formwork to be installed nor the placement of concrete to occur until the rebar has been inspected and the required inspection records have been signed by both parties. This will ensure a quality installation	Construction Management		3/15/2010	

Done Local intranet 100%

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UPF Lesson Learned FY08-00012

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The UPF Construction team proceeded to:

- Reviewed the entire source document
- Spoke with employee's that were directly involved
- Review the UPF Construction Execution Strategy pertaining to Civil Construction activities and Construction Work Packaging.
- Review the proposed UPF Construction Site Specific Procedures and Processes pertaining to Civil Construction and Construction Work Packaging.
- Develop the "Action" statement for the FY08-00012 Lesson Learned
- Ensure the UPF Procedures and Processes will mitigate the reoccurrence in the Civil Construction and Construction Work Packaging execution strategy.

HEUMF Processes

- Unclear definition of roles and responsibilities to inspection criteria. As a compensatory measure the contactor communicated the need for ownership.
- Inspection criteria not clearly defined. The compensatory measure implemented a consistent approach for conducting and documenting inspections.
- Inspections were not formalized to a structured work package. Only as a compensatory measure after project shut down.

UPF Processes

- Clearly defined work control process per Y17-95-64-800, UPF Construction Work Control Program (to be issued March 2010)
- UPF inspection records have a clear division of responsibilities for inspection process, required attributes and supporting documents required.
- As defined by Y17-95-64-800 critical installation documents are the design document required for installation and inspection.
- Critical installation drawings contained in construction work packages are treated as a controlled documents and verified current daily against the UPF DMC database.

Process Comparison (FY08-00012)

UPF Construction shall be adequately staffed with qualified personnel to support the roles and responsibilities of Y17-64-95-800 for quality installations and inspections.

- Superintendent – Supervise & oversee the installation utilizing the craft resources available in accordance with the design installation documents in the Construction Work Package.
- Civil Craft – Perform the physical installation of the materials in accordance with the design documents in the Construction Work Package.
- Civil Field Engineer – Oversee the installation and ensure technical requirements of the design installation documents are met through out the process. Perform and document in process and final inspections prior to Quality Control acceptance.
- Field Quality Control – Perform and document independent inspection per the design installation documents for in process and final acceptance of the installation.

- All personnel shall be trained to the UPF site procedures and acceptance criteria requirements.
- Discipline specific Field Quality Control personnel shall be adequately staffed to support the project.
- Field Engineering and Superintendents personnel are discipline specific and require specific qualifications to execute their role.
- Field Craft performing installation shall be trained to the process that they work to and the use of the Construction Work Packages and Inspection Records.
- Inspection Records are only signed by qualified individuals in their respective disciplines.
- Construction Work Package scope is well defined and the package contains the critical installation drawings, documents and inspection records specific to the scope of work being performed.

Upon completion of a scope defined Construction Work Package in accordance with section 6.0 of Y17-95-64-800 the evidence located in the UPF Project Document Control system, *Infowork's*, will contain:

- All completed inspection records and documentation for the scope based installation.
- The design drawing history used to perform the installation.
- Any field change documents specific to the scope of work utilized
- Relationship ties to supporting, parenting and impacted documents within the scope of the work package.

Scope specific completed quality documentation is the end product for a Construction Work Package per Y17-95-64-800, UPF Work Control Program

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HEUMF Lessons Learned

Concrete/Reinforcing
(Constructability)

Bar spacing varied throughout the facility. Differing spacing in like concrete members at intersections created bar congestion and bar grouping issues.

- Bar spacing, congestion and bar grouping issues caused an excessive number of redlines resulting increased cost and schedule impacts.

Design Engineering should consider bar spacing uniformity throughout the facility. Where additional area of reinforcing is required the A/E should consider increasing bar size or bar spacing at a minimum should have a common denominator.

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Source Document Lesson Learned FY09-00079

Resolution Selected: Addressed in the UPF Design Criteria, the UPF Structural Design and Implementation Criteria, Calculation/Drawings, and constructability reviews.

Design Criteria

DC-3-201.10.8 *A peer review of the reinforcing steel details shall be performed by a nationally recognized expert in reinforcing steel detailing and included in calculations.*

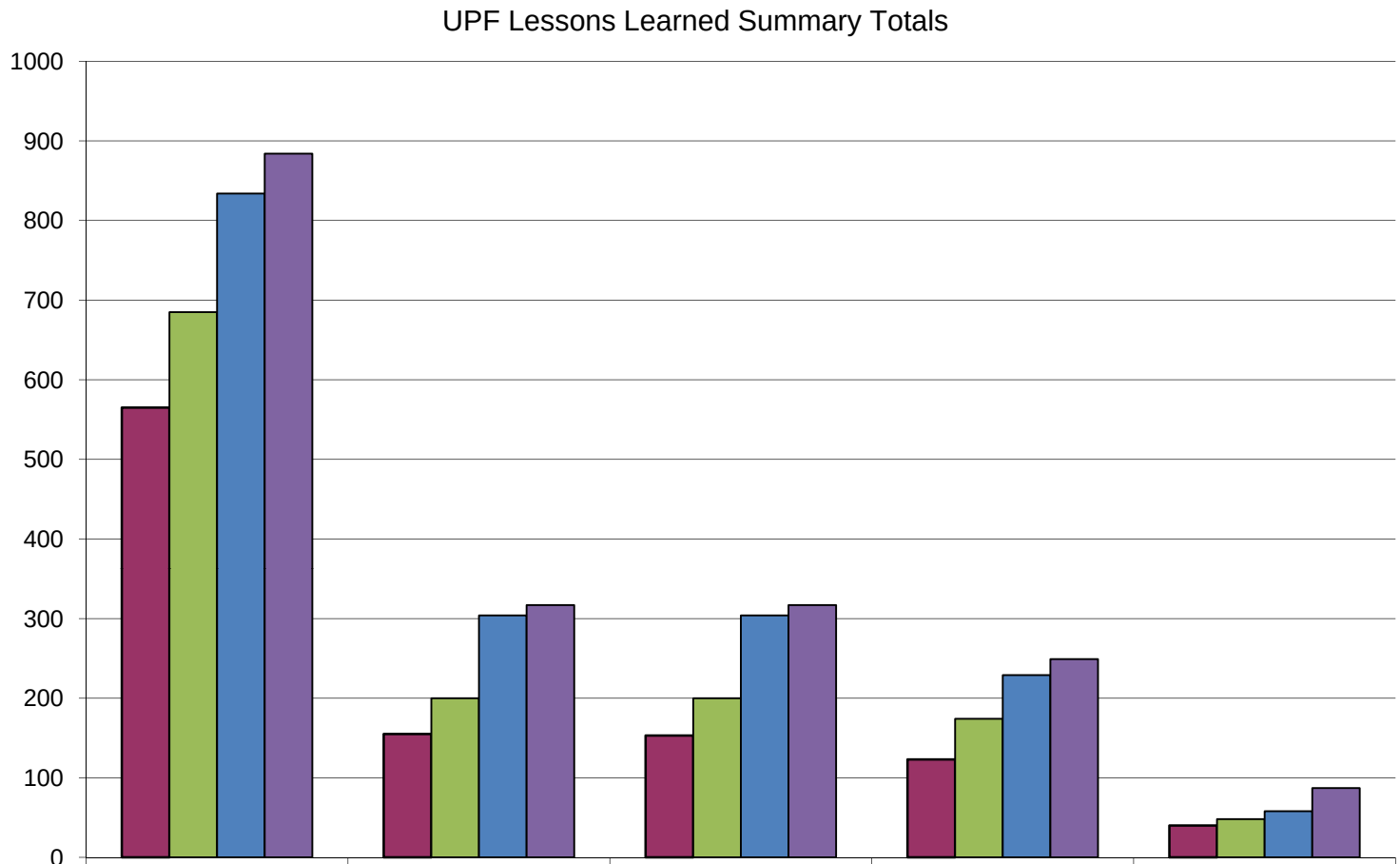
Structural Design and Implementation Criteria

Section 12.7 *The target goal for rebar spacing (and size) is uniformity across the various walls and/or slabs.*

Closure will not take place until completion of design and verification

- UPF Project Management monitors this process through metrics.
- Federal staff oversees process through participation in monthly reviews as well as periodic assessments
- Metrics are updated and published monthly in the UPF monthly report.
- Responsible manager must report status and address issues, concerns, and questions

UPF Metrics



	Lessons Evaluated	Lessons in Database	Number Assigned	Number Responded To	Total Number Closed
Mar-09	565	155	153	123	40
Aug-09	685	200	200	174	48
Nov-09	834	304	304	229	58
Jan-10	884	317	317	249	87

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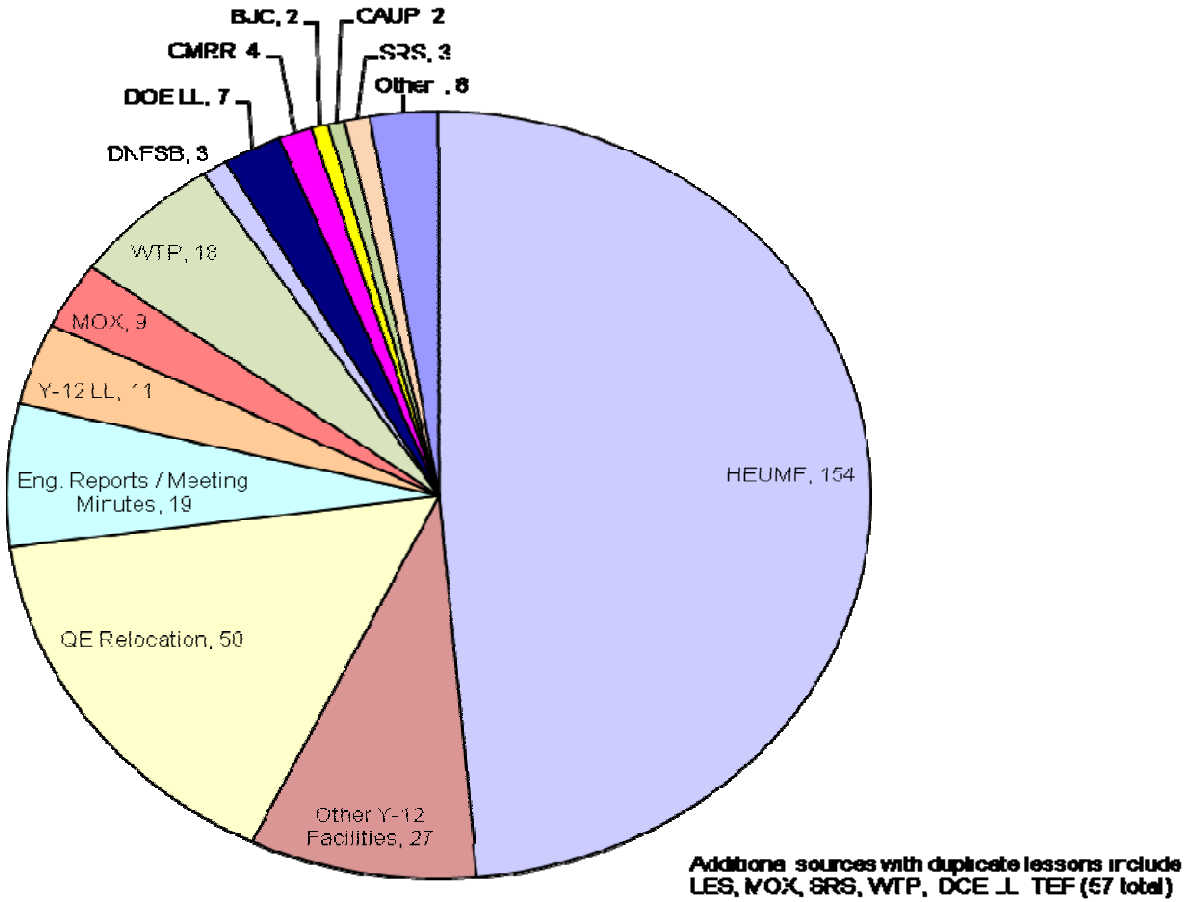
Lessons Learned Metrics

UPF Lessons Learned Sources - January 2010



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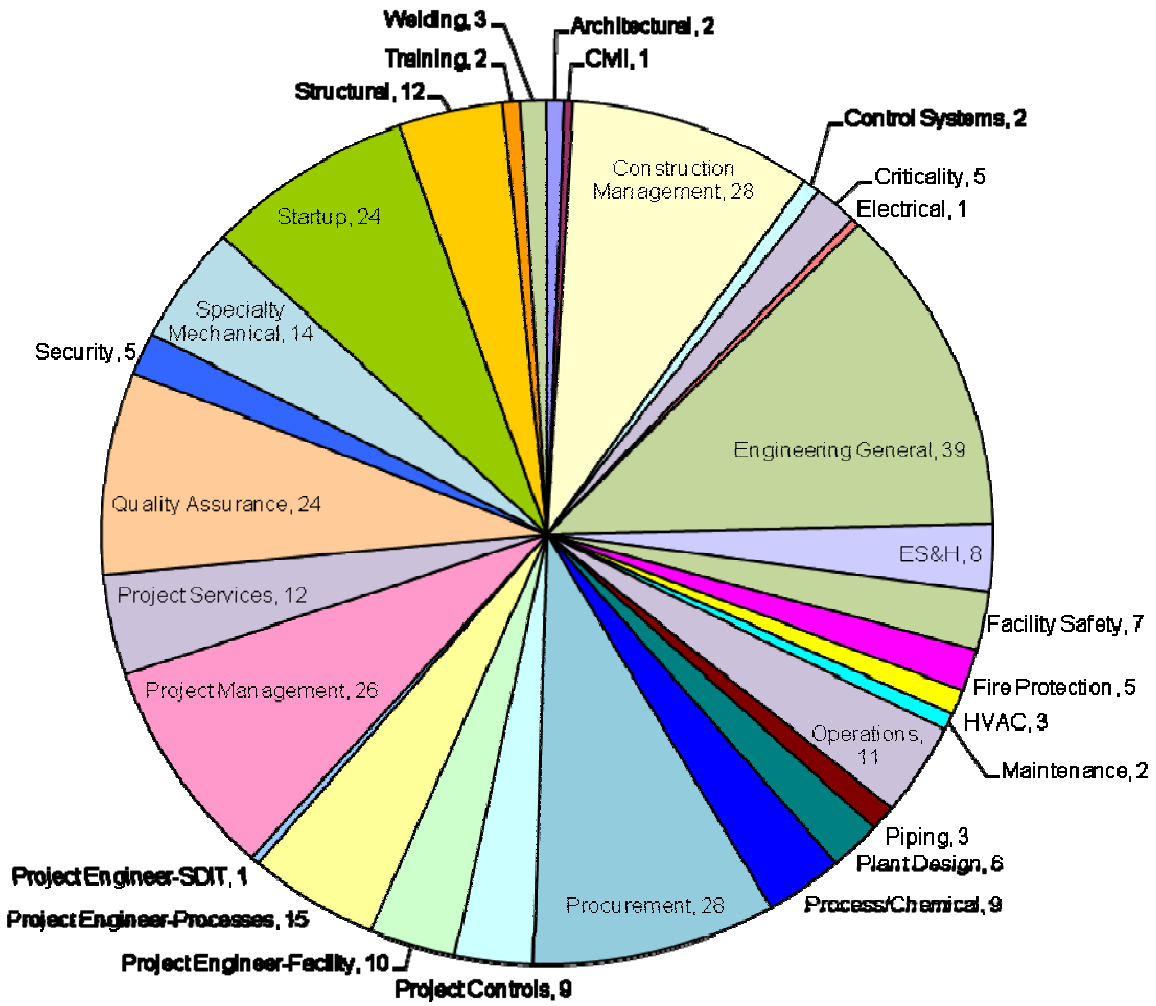
Lessons Learned Metrics

UPF Lessons Learned Organizational Assignments - January 2010



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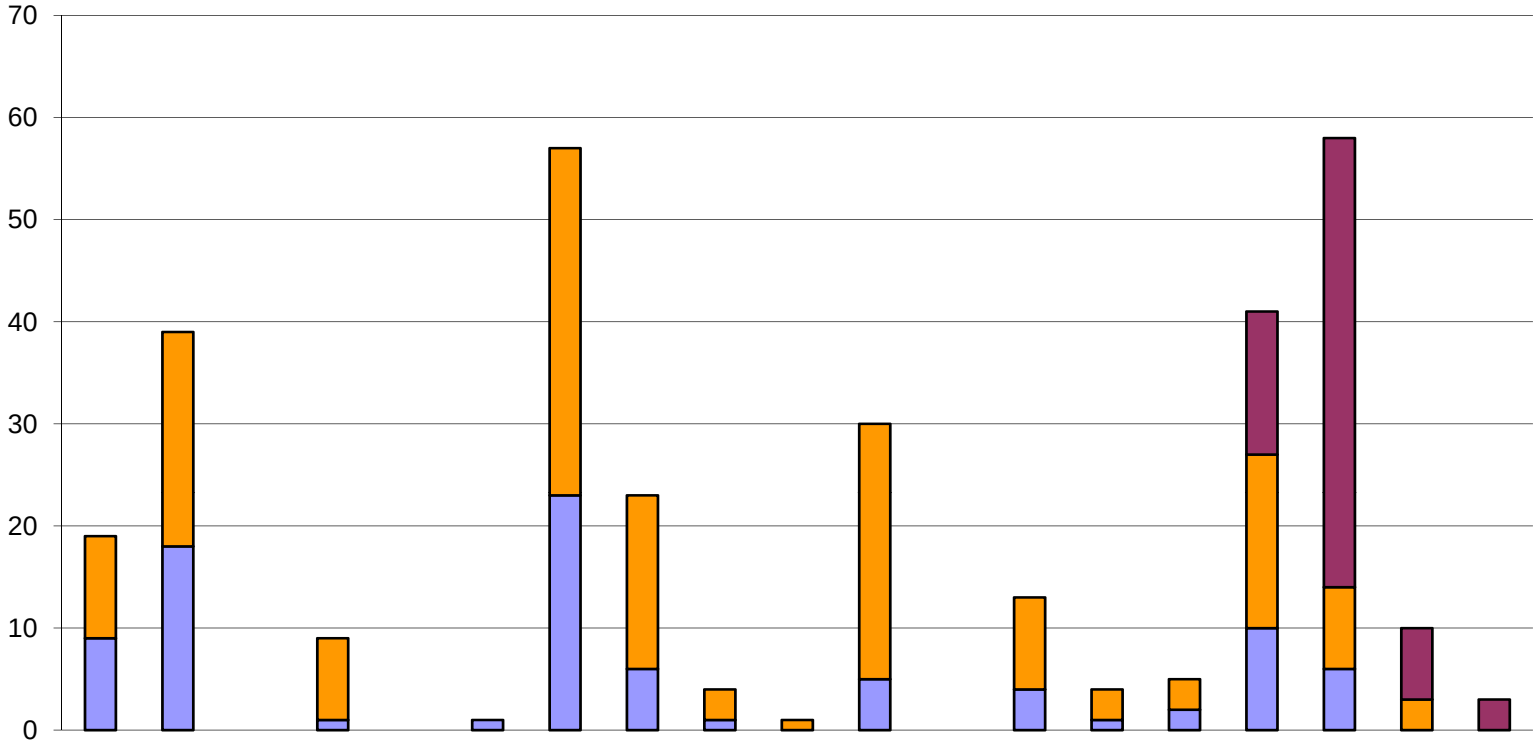
Lessons Learned Metrics

UPF Lessons Learned Aging - January 2010



	Jul-08	Aug-08	Sep-08	Oct-08	Nov-08	Dec-08	Jan-09	Feb-09	Mar-09	Apr-09	May-09	Jun-09	Jul-09	Aug-09	Sep-09	Oct-09	Nov-09	Dec-09	Jan-10
No Response	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	44	7	3
Awaiting Completion	10	21	0	8	0	0	34	17	3	1	25	0	9	3	3	17	8	3	0
Closed	9	18	0	1	0	1	23	6	1	0	5	0	4	1	2	10	6	0	0

Month Screened in LL Database

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Lessons Learned Metrics

- Consistent interaction with other projects both within and outside the DOE complex will continue throughout the life of the project to continuing the identification, qualification and resolution of lessons learned.
- Continous interaction between the UPF Project and Y-12 Operations early on and throughout UPF project will be a major contributor to reducing startup problems, increasing production effectiveness, and safety.
- The UPF Project has the benefit of being planned and executed as an integrated project in accordance with DOE-STD-1189.
- The UPF Project has the benefit of having all stakeholder representatives collocated.

Summary

- **Questions**