Idaho Treatment Group

June 19, 2014

C-2014-0212

Transmitting Electronically
cooperjr@id.doe.gov

U.S. Department of Energy
Idaho Operations Office
Attn: James R. Cooper, Deputy Manager
1955 Fremont Ave.
Idaho Falls, ID 83415-1240

Subject: Contract No. DE-EM0001467, Advanced Mixed Waste Treatment Project Transmittal of the AMWTP – Extent of Condition Review on Deferred Maintenance – DN-56-14

References: (1) David Huizenga, Memorandum for Distribution, *EM-wide Extent of Condition Review on Deferred Maintenance*, dated April 16, 2014

(2) James R. Cooper, Correspondence EM-NSP-14-020, *Assessment of Facility and Infrastructure Maintenance*, dated April 24, 2014

Dear Mr. Cooper:

In accordance with References (1) and (2), the Idaho Treatment Group (ITG) performed an Extent of Condition Review on Deferred Maintenance of the Advanced Mixed Waste Treatment Project (AMWTP). The documented review results are attached (Attachment 1).

Analysis of the data, with respect to the mandatory factors outlined in Reference (1), identified seven areas that need to be addressed by ITG. These seven areas will be reviewed using ITG'S Management Assessment Program to determine the individual path forward for each area identified (Attachment 2). Follow-on actions identified during the assessments will be integrated and tracked in accordance with the correction action process.

If you have any questions contact Mr. Wesley Bryan, ITG Plant Manager at 557-6456 or me at 557-6721.

Sincerely,
IDAHO TREATMENT GROUP, LLC

Danny Nichols, President
and AMWTP Project Manager

CEC:skc

Attachments

Attachment 1 - AMWTP – Extent of Condition Review on Deferred Maintenance, RPT-138
Attachment 2 – AMWTP Extent of Condition Review on Deferred Maintenance

cc: ***Transmitting Electronically***
Mark Barth, ITG
Penny Bowers, DOE-ID
Mark Brown, DOE-ID
Wes Bryan, ITG
Jennifer Cate, DOE-ID
Chuck Conway, ITG
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Joe Uptergrove, ITG

AMWTP
Advanced Mixed Waste Treatment Project

RPT-138

Idaho Treatment Group
AMWTP Extent of Condition Review on Deferred Maintenance

Advanced Mixed Waste Treatment Project

(Signature on file. See DCR-13540)
Charles Conway
Deputy Plant Manager

06/19/14
Date

EXECUTIVE SUMMARY

This document constitutes the Idaho Treatment Group LLC response to letters issued by Department of Energy – Office of Environmental Management (DOE-EM) on April 16, 2014 and Department of Energy – Idaho Operations Office (DOE-ID) on April 24, 2014 requiring an Extent of Condition (EOC) Review on Deferred Maintenance. Upon receipt of the letters, Idaho Treatment Group (ITG) developed an assessment plan, held meetings with the DOE-ID lead, Mark C. Brown, and had a clarifying conference call with James Hutton, Acting Deputy Assistant Secretary for Safety, Security, and Quality Programs. This review covers the mandatory factors listed as an attachment to the DOE-EM letter over a two-year period with exception as noted in the attachment content associated with each factor.

Analysis of the data with respect to the mandatory factors identified seven areas that need to be addressed by ITG. These areas and the actions deemed to be necessary are outlined below:

- Resources associated with the Work Control organization – Additional resources are identified in the Contract re-baseline that ITG is currently pursuing.
- Administrative cleanup of the legacy issues contained in the maintenance management software (MAXIMO) – ITG will utilize additional resources to address the administrative cleanup.
- Operator work-arounds associated with the Integrated Control System (ICS) alarms – Engineering will implement an alarm reduction plan which will include addressing status alarms, operating parameters and set-points, and/or adjustment of the dead band.
- Operator work-arounds associated with the control of fire system dampers – Review, revise, or develop new procedures, to include Operator training, for operation of the fire system dampers in manual mode.
- Operator work-arounds associated with the testing of fire system dampers – Evaluate the requirement for testing of three dampers; if necessary, seek exemption from testing requirements.
- Cumulative impact on facility readiness associated with outdated and/or difficult to maintain facility equipment. – Evaluate the Advanced Mixed Waste Treatment Project (AMWTP) need for hard to maintain, poor design, old/degraded, or outdated equipment and develop Engineering documents to address.
- Programs associated with caution tags, out-of-service tags, and operations locks – Program problems have been identified and program changes are ongoing.

ITG believes the funding of the majority bullets above are accounted for in the rebaseline submittal. Based upon our review of outdated and/or difficult to maintain equipment, ITG will interface with DOE-ID to identify additional funding necessary to address priority issues.

The analysis of the remaining mandatory factors did not identify issues with compliance, performance, or programmatic breakdowns that require additional actions by ITG management.

BACKGROUND

As noted in the Executive Summary, this report was prepared in response to a request from DOE-ID and DOE-EM requesting all EM Sites to conduct an EOC Review on Deferred Maintenance.

The request was driven by early lessons learned from recent Waste Isolation Pilot Plant events and directed the EOC to evaluate the following objectives/areas:

- Sufficient resources are applied to system and equipment maintenance
- Configuration controls are in place and effective to maintain systems up to date
- Necessary upgrades are made to support system infrastructure

Specific areas of focus for this review should include:

- Corrective and preventive maintenance backlogs
- Nature and age of operator work-arounds and compensatory measures
- Trend analysis of factors and characteristics associated with safety-related systems
- Cumulative impact of the combination of degraded equipment on overall operational readiness.

SCOPE

ITG conducted an EOC review of Deferred Maintenance at AMWTP using a format similar to that used for readiness reviews. This effort was initiated with a plan that identified the data set that needed to be reviewed against the mandatory factors mentioned in the DOE correspondences as well as the responsible owner(s) of the data. Two senior independent consultants, with extensive operational experience, were brought in to assist with the review. Their effort concentrated on data and document reviews, interviews and discussions, and field observations. The results from their EOC review are documented in the attachment to this report. Each area reviewed contains a narrative discussion as well as their independent conclusion. Collection of data began on April 29, 2014 with the actual independent review being performed between May 14, 2014, and June 12, 2014.

DISCUSSION

The results of the review are presented in line with the suggested objectives/areas and specific areas of focus.

1.0 Sufficient resources are applied to system and equipment maintenance (Corrective and preventive maintenance backlogs).

When ITG was awarded the contract, maintenance work planning and control was to be performed with a reduced staff. Since then the planning process was totally revised to incorporate a more comprehensive hazard mitigation process. The work control center integrated the new process requirements, which strengthened the hazard awareness and control in the work packages, at the expense of longer planning periods per package. The current staffing levels have been able to maintain throughput of preventative maintenance work packages but the corrective maintenance backlog is steadily increasing. This increase is due to the longer planning periods per package, recent attrition in the work control center, and the increased number of new work orders being driven by the aging facilities and equipment.

The current staffing levels have been able to maintain throughput of preventative maintenance work packages but the corrective maintenance backlog is steadily increasing. This increase is due to the longer planning periods per package, recent attrition in the work control center, and the increased number of new work orders. A percentage of this increase is deemed low hazard work and will require minimal planning

involvement. The original Work Planning and Control procedures did not allow full utilization of low hazard work planning. ITG recently modified its Work Planning/Control procedures to align with the DOE Handbook and URS Standard, which will allow for expediting these low hazard work activities. These changes will help offset the increase in corrective maintenance work orders by allowing minimal planning involvement for those low hazard activities. ITG recognizes the need for additional planning resources and is taking steps to increase planner staffing.

Work orders are also counted in the backlog that are awaiting administrative closeout thru the Work Control system. Insufficient resources have been applied to this function. ITG recognizes this and is taking steps to correct.

The actual performance of maintenance work has not experienced any negative or adverse conditions of consequence. The maintenance organization is sufficiently staffed to execute the maintenance work as scheduled and is flexible enough to adequately handle unplanned situations created by emergent work and/or operational needs.

The work window manager position was established as a process improvement and is responsible for working with the operation managers, work control, procurement and maintenance to determine the "true" top 15 work orders. This accumulated information is used for daily input to the Plan-of-the-Week/ Plan-of-the-Day. The impact of any work delays can be immediately analyzed and compensated for.

2.0 Configuration controls are in place and effective to maintain systems up to date and Necessary upgrades are made to support system infrastructure.

Changes to the facility are accomplished thru facility modification proposals (FMP), temporary physical changes (TPC) or temporary software overrides (TSO). During the review period 193 FMPs were generated to make changes to the facility. All were properly reviewed and approved prior to implementing the change in the field. Fifteen of the 193 were never installed into the plant. These 15 need further evaluation for cancellation or implementation. During the review period, 28 TPCs were installed to support troubleshooting and/or continued operation. All have been removed. During the review period 240 TSOs were requested to support various maintenance/operation activities. Forty five of the 240 were not approved nor installed due to not meeting required criteria. All but three TSOs have been removed and ITG is working to remove them.

Changes to the plant (FMP, TSO, and TPC) are conducted in accordance with procedures. These changes have not resulted in life safety system degradation.

3.0 Nature and age of operator work-arounds and compensatory measures.

The Integrated Control System (ICS) generates alarms in the Treatment, Characterization, and Retrieval control rooms in numbers sufficient enough that they may serve as a distraction to the operators, potentially masking alarms that may need attention. This occurs for a variety of reasons and needs engineering evaluations and corresponding ICS changes on a parameter basis in order to reduce their numbers. Examples are active alarms associated with equipment that has been removed from service, alarms hovering around set points that need evaluated for dead band changes, multiple cascading alarms received when a single parameter is exceeded, and equipment status changes initiated by the operators that are represented as alarms. Although some alarms are associated with the nuclear safety credited systems, such as the assay and fissile tracking systems, there are no automatic protective features (e.g., automatic feed cutoff) associated with these alarms that serve only to halt forward movement of waste

through the process until corrected. The ICS alarm and control system is the original design and there is a need for improvements. Although the plant has been operating with these shortcomings, the magnitude of the situation has only been recently realized through a recent initial comprehensive evaluation. It is considered an extensive effort to evaluate and correct all of these issues on an individual alarm basis.

Fire dampers in the Treatment Facility are designed to operate in both automatic and manual modes. In automatic mode, a signal from a fire panel closes dampers in an alarming zone, and in manual mode the closure of dampers is done by control room operators from a damper control panel. Mode selection is via a keyed selector switch on the control panel. Operation of the system has historically been problematic in the automatic mode due to inadvertent damper closures, resulting in a perturbation in the building ventilation flow and a corresponding shutdown of the entire system. Due to concerns with loss of contamination containment, the fire damper control system is being operated in manual. Regardless of the mode selected with the key selector switch the damper heat sensor is operable and will shut the damper. An associated concern exists in that the operating procedures do not contain instructions for manual damper operation. Further, the current protocol for a fire in the Treatment Facility is to evacuate the building, so there is no access to the fire damper control panel to enable operation of the dampers. The AMWTP Fire Marshal is aware of this issue and is evaluating several paths forward. One is to re-evaluate the necessity to always evacuate the building in case of fire and to provide instructions for manual damper operation to the operators. Another is to re-evaluate the operation of the dampers in automatic. A third is to re-evaluate the original design for dampers to be remotely closed in either manual or automatic.

Some equipment in the Treatment Facility, if not operable or optimized, has required Operations to use the Brokk manipulators more than would normally be required. This results in added workload for the Brokks and can lead to an increase in Brokk failures. When the Big Lifts or Quads are not operating properly, they can either be too high or low. This misalignment can cause boxes to have difficulty navigating the conveyors. When this occurs, operators use the Brokk to assist the boxes so that they can be processed. This is a long reach for the Brokk and can also cause hoses to snag, creating a need for increased corrective maintenance. The clamping frames were taken out of service in 2007 after continued troubleshooting efforts and modification proposals were determined not to be worthwhile. The absence of the clamping frame requires Operations to either place the box in the trough or to extract the contents from a partially tipped box. Both require additional work by the Brokk manipulators. Also, when the shredder is not available, boxes are processed in the trough. Again, this results in added work by the Brokk manipulators, which can lead to increased failure rates.

4.0 Trend analysis of factors and characteristics associated with safety-related systems.

The credited nuclear safety systems, specifically the real time radiography (RTR) and box/drum assay systems were experiencing availability issues primarily due to failed surveillances. Improvements to availability of these systems have been made through reanalysis of their safety function and corresponding changes have been made to the documented safety analysis (DSA) and Technical Safety Requirements (TSRs). The changes no longer credit the RTR systems as being safety significant but instead as standard industrial hazards, so their corresponding TSRs, Limiting Conditions for Operations (LCOs), and Surveillances were removed. The LCOs for the box/drum assay systems were adjusted to make LCO entry requirements more reflective of their safety function.

Radiation monitoring systems at this facility are not credited as nuclear safety systems. They consist of continuous air monitors (CAMs) that provide an alarm function only, with exception of the CAMs in the storage buildings, which serve to shut down unfiltered building ventilation in case of alarm. Equipment availability has not been an issue, because if a CAM fails due to equipment issues or testing, a temporary

CAM is installed to continue the function until corrections are made. The frequency of CAM failures is consistent with the industry. There has been as issue with the number of CAM alarms in the non-facility areas due to radon buildup on the sample collection filters. These alarms have been reduced to an acceptable level through more frequent filter changes and adjustments to alarm settings that minimize alarms due to spikes. Additionally, Radiological Controls is adding 56 new retrospective air samplers to provide improved coverage in all of the Type II, TSA-RE, and other storage locations in the event of an upset condition.

The primary life safety system is the fire protection system. Quarterly internal evaluations and a comprehensive annual evaluation are conducted to monitor the effectiveness of the system and have resulted in only minor exceptions. In addition, ITG and DOE-ID completed a joint assessment of the AMWTP fire protection program in February 2013. The team concluded that ITG implements a comprehensive documented fire protection program with specific programmatic elements as required by DOE Order 420.1B, and implementation of fire protection related orders, codes, and standards, also with minor exceptions. The remainder of the life safety systems (e.g., emergency lights, fire extinguishers) is kept available through scheduled inspections and testing, and any corrective actions are tracked and performed by maintenance. There have been no significant issues in these areas.

Another concern with ventilation fire dampers in the Treatment Facility is that three of the fire dampers are not being tested due to their very difficult accessibility in radioactively contaminated cells. The AMWTP Fire Marshal is aware of this situation as well. Based on a preliminary evaluation, the probable solution is to seek an exemption from testing these dampers, due to personnel hazards accessing the dampers and because there are other dampers in series with these that serve to isolate a fire.

5.0 Cumulative impact of the combination of degraded equipment on overall operational readiness.

Some plant equipment has demonstrated degradation that has contributed to overall project operational readiness. As mentioned previously, the Brokk manipulator readiness has been impacted by increased need for corrective maintenance due to added workload when compensating for other degraded equipment. The Big Lifts and Quads on the box conveying systems have been difficult to keep functioning at optimized performance. When this occurs, their repair or a failed Brokk due to compensating for the conveying system problems, additional attention from maintenance is required, which impacts operational readiness. The problems with the clamping frames are somewhat similar and can lead to added maintenance of the Brokk manipulators.

The Facility Gantry robots have begun to demonstrate degraded performance. This is directly attributed to the age of the computer hardware and the local software. The hardware is over a decade old and has the original software written by the manufacturer (C&D Robotics). The hardware has had issues with retaining its program. The software was written for older hardware and cannot be easily transferred to newer computer systems without changes to the code. When instances occur that result in loss of the program, significant time can be lost reloading the software. Depending on which robot is affected, the facility can either be partially impacted and some boxline operation can continue, or fully impacted and the boxlines and assay systems can be stopped.

In WMF-634, the air compressors that supply air for the buildings drum conveying system and for some of the building ventilation show signs of degradation from use. The compressors have had increased failures due to excessive vibration and continuous cycling. The compressors are in need of replacement

with more robust compressors. Failure of these components directly impacts Characterization's capability to perform drum assay and drum venting operations.

RTR 1001 has outdated hardware and is not capable of supporting newer software updates. It has experienced failures associated with the hardware in the past and limits the ability for Characterization to perform necessary examinations of containers.

WMF-634 Makeup Air Units have exhibited degradation due to age. These units are needed to supply fresh air into the building that is heated. It is not the primary source of heat for the building, but when it cannot heat its air, the building temperature in the winter drops. If building temperature cannot be maintained above a certain point, RTR can be impacted. Temperature requirements are placed on the operation of RTR to ensure liquids are not frozen which would prevent liquids from being identified in containers.

6.0 Other conclusions from assessment.

In November 2012, DOE completed a review of the Issues Management and Corrective Actions Program, which resulted in the determination that ITG had failed to effectively implement its program processes and programmatic failures had contributed to the recurrence of events and injuries that should have been prevented. In May 2014, DOE completed a follow up of corrective actions and concluded that the ITG program is effectively implemented under the contract parameters with no findings or concerns.

A review of the corrective action database concluded that there were 55 procedure noncompliance events related to the operating facility. A corrective action report (CAR) was issued for each event. Of those, 38 were attributed to human performance errors and 17 were attributed to written communication errors (e.g., procedure approval without proper comment resolution, failure to complete inspection form properly). Action items have been completed and, with the exception of five, all of these CARs have been closed. Of these, two have actions complete and are awaiting Quality Assurance verification prior to closure of the CAR and three are awaiting the completion and verification of action items. There is a continued focus via the various assessment and observation programs to identify and keep procedure noncompliance to a minimum.

There were 5,233 Management Oversight Program (MOP) tours conducted that generated corresponding reports and data. The tours were focused primarily on plant operations. Of those, 592 resulted in identified performance gaps and deficiencies. These were corrected on the spot between the observers and workers, entered as action items into the site tracking system (TrackWise) for documentation and record of closure, or determined to be conditions adverse to quality for which CARs were generated. There is a recognized need for improvements to the MOP, particularly to improving the focus of the MOP tours and the collection of data. Also needed is an improvement in the frequency senior managers are visiting the field. Revisions to the controlling procedure have been completed and training is currently being implemented. In addition to the MOP, there were 210 Management Assessments conducted, resulting in 588 action items being entered into the TrackWise system or CARs generated. These assessments are identifying a limited number of noncompliance conditions and a larger number of improvement and action items. Focused assessments in addition to those predetermined and scheduled are performed as concerns may arise, focused on potential risks that could have an impact on the project.

All AMWTP personnel have step back/stop work authority and use it if questions or concerns are raised, safety issues are raised, or work can't be performed as written without fear of retaliation. Use of step

back/stop work to resolve issues identified by the workforce provides for a positive work environment and greatly increases the success of AMWTP's work.

AMWTP has a procedure that implements the fact finding requirements of DOE O 422.1, Conduct of Operations. This procedure provides a graded approach for preparing and conducting fact finding meetings and management reviews, and it establishes a consistent method of initial fact finding, event reconstruction, and event evaluation. The fact finding process is required to identify facts that support identification of potential causal factors for Occurrence Reporting and Process System (ORPS) reportable events and other operational events. The process has enabled ITG to clearly and thoroughly understand the situational circumstances to ensure the appropriate corrective measures are expeditiously implemented to minimize the possibility of recurrence.

While AMWTP's Contractor Assurance System (CAS) as defined in company procedures is compliant with contract requirements, the program is not meeting management's expectations for effective implementation in all areas.

A CAS Improvement Plan was developed and is currently being implemented, which was designed to identify short term actions that improved performance quickly and longer term actions that should sustain the program and assist in continuous improvement activities.

ITG successfully completed Integrated Safety Management Systems (ISMS) Phase II verification in July 2013. Based on results and ITG's response to identified issues, the review team concluded that "Safety was systematically integrated into ITG's management, work practices, processes, and organizational culture." The team found ITG demonstrated that management is striving to create and maintain an environment where employees are comfortable raising concerns without fear of retaliation. Employees are also aware of the Employees Concern Program and the Differing Professional Opinions Program and would not fear retaliation for using these programs and in addition.

In June 2014, DOE and contractor assessors evaluated AMWTP's Voluntary Protection Program (VPP) and informed AMWTP they will be recommending that AMWTP maintain its designation as an official Star level VPP site.

The success of this evaluation was made possible because of every employee working at AMWTP. VPP is the people side of performing work and requires active employee involvement and decision-making in the safety process to ensure a safe and healthy work site.

The VPP Assessment Team saw many positive improvements since the last review in 2009. "We saw a significant improvement in the confidence and pride of the workforce since 2009." "There is a genuine confidence and pride in what you are doing and we saw numerous examples of direct employee involvement in safety."

As the VPP Assessment Team reminded everyone, it is far harder to keep a VPP Star than it is to earn the VPP Star. By receiving the positive recommendation, the workforce, once again, proved its active engagement in safety, active caring for the well-being of their co-workers, and the pride that is an inherent part of an outstanding operating facility.

The lockout/tag out (LO/TO) program is compliant with DOE requirements and is being executed with the necessary rigor and formality to ensure personnel are protected from hazardous energy sources. Operations programs not associated with hazardous energy sources provide information and control of

equipment in the field. These are the use of caution tags, out-of-service tags, and operations locks. Administrative issues with the supporting programs have been identified, are in the process of being corrected, and do not impose a major issue.

Temporary procedure changes are not used in the AMWTP. However, field changes are issued when a procedure cannot be followed as written, or due to an unanticipated operational and/or maintenance condition that might stop work or cause it to be unreasonably delayed. During the review period, 127 field changes were made to procedures. This is deemed acceptable because all of the field changes are properly approved and by definition are part of the already approved revision of the procedure.

There have been nine instances where radioactive skin contaminations have been received in the past two years, of which two were ORPS reportable and seven were ORPS non-reportable. None were due to program issues but were either accidents in contaminated areas or material failures that have been recognized and corrected. One chemical exposure occurred where workers wearing proper protective gear smelled ammonia during a collection container draining operation. The workers experienced minor discomfort, but there were no long term health concerns and the incident did not meet the criteria for ORPS reporting.

TABLE OF CONTENTS

1.0 Number of Unplanned TSR/LCO Entries

Documents Reviewed

- Plant Shift Managers (PSM) Log Summary for 2012 (May 1, 2012 through December 31, 2014)
- PSM Log Summary for 2103
- PSM Log Summary for 2014 (January 1, 2014 through April 30, 2014)
- RPT-DSA-02, Documented Safety Analysis, Rev. 8
- RPT-DSA-02 Rev. 9
- RPT-DSA-02 Rev. 10
- RPT-TSR-03, Technical Safety Requirements, Rev. 11
- RPT-TSR-03 Rev. 12
- RPT-TSR-03 Rev. 13
- EM-NSPD-13-072, Safety Evaluation Report (SER), Revision 2, Addendum D
- RPT-DSA-01-IM, AMWTP Safety Basis Implementation Matrix for RPT-DSA-02, and RPT-TSR-03, Rev. 7
- RPT-DSA-01-IM Rev. 8
- RPT-DSA-01-IM Rev. 9

Interviews Conducted

- Nuclear facility manager

Field Observations

- None

Narrative

A comprehensive review of the PSM log was completed for a two-year period of time (May 1, 2012 through April 30, 2014). Data associated with the number of unplanned TSR/LCO entries was assembled for evaluation with the following results:

1. RPT-DSA-02 Rev. 8 and RPT-TSR-03 Rev. 11 were the approved safety basis documents from May 1, 2012 through August 22, 2012. During this period of time, the site experienced 16 unplanned TSR/LCO entries.
    - Fourteen were associated with safety-significant assay machines

- One was associated with the safety-significant real-time radiography (RTR) system
- One was associated with the Fissile Tracking System (FTS).

RPT-DSA-02 Rev 9 and RPT-TSR-03 Rev. 12 were implemented on August 23, 2012. The revision refined the accident consequence and likelihood based on improved assumptions. The RTR was evaluated as a standard industrial hazard and was removed from the safety-significant equipment listing analyzed by the DSA. The safety basis revision also amended the control set for the assay machines.

These actions significantly reduced the number of unplanned TSR/LCO entries especially those associated with assay machines.

2. The log review from August 23, 2012 through May 2014 identified 15 unplanned TSR/LCO entries because of various failures.

   - Eight were associated with barcode labels
   - Three were associated with the FTS
   - Two were associated with the Criticality Incident Detection and Alarm System (CIDAS)
   - One was associated with the Waste Tracking System (WTS)
   - One was associated with an assay machine.

   One of the eight unplanned TSR/LCO entries, associated with the barcode labels, was an actual TSR violation. The other seven were barcode reader and barcode labeling issues. Corrective actions are being taken to provide a defense-in-depth engineered control, which reads and compares barcode labels on each drum imported into the facility. Prototype equipment for the engineered control has been designed, built, and installed in the facility to allow real time testing and determination of path forward.

   The unplanned TSR/LCO entries for the CIDAS, FTS, WTS, and the assay machine were primarily attributed to expected equipment failures or site power fluctuations.

Conclusion

The number of unplanned TSR/LCO entries was evaluated to be consistent for normal facility operations and that no adverse condition to safety has been created.

2.0 Number of Inoperable Control Room Indicators and Controls, Number of Lit/Alarming Control Room Annunciators

Documents Reviewed

Integrated Controls System (ICS) printouts for four months (1/1/14 to 4/30/14) for the following alarm systems:

- System 101 Retrieval Contamination Enclosure (RCE)
- System 214 Retrieved Drum Assay (Characterization)
- System 225 Drum Vent Facility (DVF)
- System 310 Drum/Box Import (Area 300B Facility)
- System 320 Box Import (Area 300A Facility)
- System 330 North Box Line (Area 300A Facility)
- System 335 North Boxline Gantry Robot (Area 300B Facility)
- System 340 South Box Line (Area 300A Facility)
- System 345 South Boxline Gantry Robot (Area 300B Facility)
- System 350 Box Size Reduction (Area 300A Facility)
- System 352 LLW Import/Export (Area 300A Facility)
- System 370 Drum Transfer Gantry Robot (Area 300B Facility)
- System 390 Assay Conveying Gantry Robot (Area 300B Facility)
- System 410 Infeed Glovebox (Area 400 Facility)
- System 412 Super Compactor (Area 400 Facility)
- System 420 Post Compaction Glovebox (Area 400 Facility)
- System 422 Puck Drum Conveying (Area 400 Facility)
- System 423 Super Compactor & SCW Import (Area 400 Facility)
- System 440 (SCW) Special Case Waste (Area 400 Facility)
- System 600 Utilities & Services (Area 700 Facility)
- System 710 Zone 1 Supply Ventilation (Area 700 Facility)
- System 720 Zone 1 Extract Ventilation (Area 700 Facility)
- System 730 Zone 2 Supply Ventilation (Area 700 Facility)

- System 740 Zone 2 Extract Ventilation (Area 700 Facility)
- System 750 Zone 3 Extract Ventilation (Area 700 Facility)
- System 760 Zone 3 Glove Box Extract Ventilation (Area 700 Facility)
- System 770 Heat Recovery (Area 700 Facility)

Alarm data for continuous air monitors (CAMs) collected over a two-year period

Interviews Conducted

- Interviews were conducted with the ICS Computer System lead, facility managers and control room operators in the Treatment, Characterization, and Retrieval control rooms.

Field Observations

- None

Narrative

The ICS system generates alarms in the Treatment, Characterization, and Retrieval control rooms. A historical sample of these alarms was taken over a four-month period, 1/1/14 through 4/30/14. Information gathered provides the date and time the alarm was received, as well as the alarming parameter. During the sampling period, alarms were received numbering in the thousands, the majority of which were the same parameters alarming at a high frequency. Although an initial evaluation indicates there are no plant degradation issues similar to those that resulted in the WIPP incident, there are issues nevertheless that need to undergo a more detailed evaluation. The high number of alarms appears to be largely associated with how the alarm and control system currently operates. For example, normal operations such as control switch manipulations in the plant are transmitted to control rooms as visible and audible alarms versus simply as status changes. Another example is that some alarms have no reset dead band, so they transmit a stream of alarms as they hover around a set point. A third is that some process alarms are cascaded, such that one device initiates a multitude of alarms. A potential consequence of how this system operates is that the volume and types of alarms received may serve as a distraction to the console operators, masking other alarms that may require attention.

An evaluation of alarm data by Engineering summarizes the various causes for alarms as follows:

- Active alarms that do not clear due to equipment (lid removal station, clamping frames, port door pressure switches) removed from service and need to have their alarms deactivated
- Alarm settings that need to be revised by the changing of set points
- Alarms generated by parameters hovering on their set points, the numbers of which need to be reduced by the addition of dead bands
- Equipment status information that should not be received as visual and audible alarms
- Multiple cascading alarms received when a single parameter is exceeded (light curtain trips)

- Data quality fault alarms, possibly power related
- Alarms related to maintenance and lockout/tagouts
- Alarms related to the WTS, such as failed barcode readings and needed map updates from failed tracking events.

CAM alarms are not generated by the ICS system but by the Radiological Surveillance System (RSS) in the AMWTF. For the non-facility areas, local CAM alarm information is collected by the Alpha-7 Client system. Data was collected from these systems over the previous two-year period. For the facility area, 57 alarms were received. Of these, 13 were alarms indicating maintenance required (low flow due to filter plugging, pump issues, etc.) and 44 were real alarms attributed to temporary ventilation losses and associated increased airborne activity in the sub-change rooms. For the non-facility areas, a total of 141 CAM alarms were received. All were false, attributed to radon buildup on the filters. During this time, changes were made to CAM operation that significantly the number of false alarms. CAM filters are changed more frequently, reducing the amount of radon buildup between changes. Alarm settings were changed from derived air concentration (DAC) at a single set point to a time weighted set point of DAC-Hour.

Conclusion

This was the first time a report of this nature has been generated and distributed to the Engineering and Operation managers for review. It indicates the need for further evaluation of the alarm and control system, with focus on reducing the numbers of alarms and differentiating various types of alarms.

There are no unknown inoperable control room indicators and controls in the Treatment, Characterization, and Retrieval control rooms other than those summarized in the above engineering evaluation.

3.0 Corrective and Preventive Maintenance Backlog, Age, and Trend

Documents Reviewed

- MAXIMO Excel Spreadsheets
- MAXIMO User Guide
- PD-CMNT-01, Nuclear Maintenance Management Program Description
- MP-COPS-9.18, Work Management, Planning, and Control
- MP-CMNT-10.19, Computerized Maintenance Management System
- INST-CMNT-10.1.4, Maintenance Instructions

Interviews Conducted

- Plant Support manager
- Work Planning & Control lead
- Work planner
- Work planning administrative assistant
- Maintenance and Landlord manager

Field Observations

- None

Narrative

Administrative functions in Maintenance are performed and maintained through MAXIMO, the AMWTP Computerized Maintenance System. This is a commercial, off-the-shelf client-server application that provides a platform for users to prioritize tasks, assign work based on the availability of necessary parts and labor, and analyze equipment failures to implement appropriate preventive/predictive maintenance measures. MAXIMO contains a master equipment list (MEL) that provides the backbone from which all the functionality is then applied. The MEL is under configuration control.

Maintenance history is maintained on the MAXIMO system and reports are generated as needed on specific safety significant systems, structures, and components (SSCs). The information collected is available to trend equipment behavior and failure. The MAXIMO system is also used for spare parts tracking and purchase requisitions. A set of reports is available within the MAXIMO system that spans the breadth of activities involved in the system health. It is possible to track costs, usage of pars, work orders, plant history, scheduled maintenance, and other features all form one system.

MAXIMO contains a reporting tool that when queried, is used to define trends, by facility or work group, in items such as corrective or preventive maintenance backlog greater than 90 days, total open work in an area, planning backlog, planning estimate accuracy, delinquent and deferred preventive maintenance, etc.

An excel spreadsheet of all work orders was reviewed on June 4, 2014. This spreadsheet is populated by information from MAXIMO. This provided a single reference point to analyze the maintenance backlog and age. The following chart summarizes this review.

Category	Total Jobs On Schedule	Total Past Target Completion Date	> 1 year Past Target Completion Date	> 180 days but < 1 Past Target Completion Date	> 90 but < 180 days Past Target Completion Date	> 0 but < 90 days Past Target Completion Date
CM	83	60 (72%)	12 (20%)	7 (12%)	12 (20%)	29 (48%)
PM	408	106 (26%)	9 (8%)	23 (22%)	14 (13%)	60 (57%)
WR	218	114 (52%)	2 (1%)	6 (3%)	42 (19%)	64 (29%)
	709	280 (39%)	23 (3%)	36 (5%)	68 (10%)	153 (22%)

CM = Corrective Maintenance
PM = Preventive Maintenance
WR = Work Requests (Will become CMs)

The quantities/percentages are misleading and require explanation.

Work control flow path through MAXIMO is:

- Work order submitted into MAXIMO
- Work order reviewed for acceptance, rejection – if accepted it is given a priority and becomes a WR (which in turn becomes a CM)
- WRs or PMs are assigned a planner as their workload allows
- PLANNING stages generally cover package development, system engineer and manager reviews, ordering and obtaining materials, and approval
- SCHEDULE – MAXIMO term that covers the time the work package is checkout from the work control center, through execution of work, testing, turnover to ops, until it's checked back into the work control center.
- Once the package is checked back in it is documented in MAXIMO as received and is no longer tracked as part of the backlog.

MAXIMO automatically assigns a target completion date if the work order does not state one. The default date is set eight weeks out. Specific personnel have the authority to change this date

based on site/facility needs. The target completion date forms the foundation that all work control is tracked against when determining whether the work is ahead or behind schedule.

The chart above states that sixty corrective maintenance work packages are past their scheduled completion date. Of the 60, 38 are in a SCHEDULED status and nineteen are in one of the general PLANNING stages. As mentioned earlier, the SCHEDULED status covers the time between check out and check in to the work control center. When a work package is checked in through MAXIMO it is no longer tracked on the excel spreadsheet. Three months ago a position was established with the responsibility to facilitate the check out/check process. Prior to this the check in process was someone laying the executed work package on a planner's desk. Planners would set these packages aside because the focus was planning new work. These packages remain in the SCHEDULED status even thought the work has been completed and the equipment turned over to operations. A significant amount of executed work packages are assembled in the work control center awaiting to go through the check in and closeout process.

The chart also reflects that 106 preventive maintenance work packages are past their scheduled completion date. Seventy of these are in a SCHEDULED status and 34 are in one of the general PLANNING stages. The situation is the same for preventive maintenance work packages as was mentioned above for corrective maintenance.

When resources become available the work packages in a SCHEDULED status can be processed through the closeout process and removed from the tracking spreadsheet. Corrective and preventative maintenance work packages in the PLANNING stages need to be evaluated to determine if they are still required or assigned a new completion date if they are just being pushed out by emergent work. Evaluating the SCHEDULED and PLANNING statuses will bring the total past due backlog down from 39% shown in the chart to a more realistic and factual 17%. The ability to do this is totally resource driven.

When ITG was awarded the contract, maintenance work planning was to be performed with a reduced staff. Since then the planning process was totally revised to incorporate a more comprehensive hazard mitigation process. The work control center integrated the new process requirements, which strengthened the hazard awareness and control in the work packages, at the expense of longer planning periods per package.

The work control center presently has six qualified planners, three handle corrective maintenance work packages and three others handle preventive maintenance packages. A seventh person is presently going through the qualification process. Throughput of corrective maintenance work packages is approximately three packages per planner per week and approximately 13 work packages per planner per week for preventive maintenance.

New corrective maintenance work orders are on an increase. The chart below shows a breakdown by month for the last three months.

Month	PM's	CM's	Total
March 2014	228	112	340
April 2014	244	136	380
May 2014	247	151	401

The aging of facilities and equipment has caused the volume of emergent work to increase which in turn requires immediate planner involvement. "Production Critical Equipment" availability numbers have steadily increased (positive trend), which points to an improvement in addressing emergent work. Conversely, the increase in emergent work reduces the amount of time allotted for backlog reduction. Several work orders related to degraded equipment have been in "planning" for greater than eight weeks (negative trend).

Life safety systems are being worked as priorities. Those that remain in the planning backlog are reviewed weekly and placed in the planning "que" as resources are freed up.

In late 2013, ITG recognized that execution of the preventive maintenance program was inadequate and that a focused effort was needed to reverse the trend. Realizing MAXIMO was still a maturing software program combined with the administrative concerns mentioned earlier a decision was made to track PMs in a different manner. In January 2014, a concentrated effort was placed on the completion of PMs and along with this effort the work control organization started manually counting the development and approval of preventive maintenance work packages while the maintenance organization began manually counting the execution of these packages. The data collected by the two organizations was compared to the desired completion date to obtain meaningful data associated with overdue PMs. Although this information doesn't agree with data obtained from MAXIMO, the trend of missed or delinquent PMs has shown a significant improvement over the past six months.

The work window manager position was established as a process improvement. This individual is responsible for working with the operation managers, work control, procurement and maintenance to determine the "true" top 15 work orders. This accumulated information is used for daily input to the Plan-of-the-Week. The impact of any work delays can be immediately analyzed and compensated for.

Conclusion

The longer planning periods associated with the revised work control process plus the increased number of new work orders being generated by the aging facilities is creating a corrective maintenance backlog challenging the capacity of the existing staff. Attention needs to be placed on obtaining and qualifying additional resources to address the increased backlog. The planning effort associated with emergent work and preventive maintenance is being aggressively and effectively managed.

The computerized maintenance tracking software MAXIMO contains a significant amount of legacy information requiring disposition. The data collected and available through MAXIMO requires manual sorting, to eliminate this information, to produce a meaning schedule. In some cases a manual count is necessary to account for work package development and execution of work packages.

4.0 Surveillances Performed in Grace Period and Trend

Documents Reviewed

- Spreadsheet – Surveillances Performed Since 2012
- RPT-TSR-03 Rev. 13
- RPT-TSR-03 Rev. 12
- RPT-DSA-01-IM Rev. 9

Interviews Conducted

- Plant Engineering manager

Field Observations

- None

Narrative

The spreadsheet reviewed listed all surveillances performed since the beginning of 2011 to present. It also listed the Work Order number the surveillance was performed in accordance with, the actual completion date, and an explanation of any mode of operation changes which may have impacted the completion of the surveillance.

From the beginning of 2011 through August 2012 there were 11 different surveillance requirements. The minimum frequency associated with these surveillances was semi-annual. Section 1.6 of RPT-TSR-03 defines semi-annual as being at least once every 180 days with a grace period definition of 225 days. During this time period, the spreadsheet revealed eight instances where the surveillance was performed in the grace period each time by only one day.

In August 2012 a revision to the Documented Safety Analysis (DSA) and the Technical Safety Basis was implemented. This change eliminated nine of the previous surveillance requirements and added six new requirements for a total of eight active surveillance requirements. The minimum frequency associated with these surveillances was semi-annual. From August 2012 to present, there was one instance where the surveillance was performed one day into the grace period.

One additional surveillance requirement was added after the August 2012 revision with an annual frequency requirement. Section 1.6 of RPT-TSR-03 defines annual as being at least once every 365 days with a grace period definition of 456 days. This surveillance requirement was performed within the required frequency.

Conclusion

The review identified nine surveillances that were performed within the allotted grace period but each was only by one day. The remaining surveillances are performed within the required frequency. No adverse condition or trend was identified.

5.0 Safety System Availability, Performance when Tested, and Response to Actual Demand

Documents Reviewed

- AMWTP IT&M Program Quarterly Evaluations
- 2013 AMWTP Fire Program Assessment (March 12, 2013)
- MAXIMO work planning system for work in a current planning state
- PSM Log
- Technical Safety Requirements Surveillances

Interviews Conducted

- None

Field Observations

- None

Narrative

Safety system availability and performance at the AMWTP was reviewed in the context of nuclear safety (credited safety significant SSC), radiation safety (constant air monitors [CAMs]), and life safety (fire protection, emergency lights). The review was conducted for the previous two-year period.

Nuclear Safety Systems, Structures, and Components Availability

1. Real-Time Radiography Systems

   From May until August of 2012 the RTR systems were identified as safety significant in the DSA, and were unavailable due to entering an LCO and placing an RTR into suspension mode because of equipment failure on three occasions. As of August 2012 the RTR systems were no longer credited as Safety Significant as explained in the summary below.

2. Drum and Box Assay Systems

   Also considered as safety significant in RPT-DSA-02 are components of the drum assay systems and components of Box Assay Unit Z-212-105. From May until August of 2012, entry into an LCO resulted in individual drum assay units within the system becoming unavailable on numerous occasions, and the box assay unit on two occasions. A revision to the DSA and TSR in August of 2012 improved their availability such that in 2013 there were no occasions where the drum assay units were available due to entry into an LCO and only one occasion where the box assay unit was unavailable. In 2014, the drum assay systems LCO was entered on three planned occasions for system updates and one

unplanned occasion for a Nuclear Criticality System Performance Check condition upon report of a broken tamper indicating device (TID). Upon further investigation the TID was found to be intact. The LCO was entered in error, but still an unplanned entry. Also in 2014, the box assay system has not been made unavailable. Details of the DSA and TSR changes are contained in the summary below.

3. Special Case Waste Packet Assay Monitor (SCWPAM) Assay System

   The AMWTP DSA credits components of the SCWPAM System Z-440-875 as safety significant. There were no occasions for the reporting period where SCWPAM assay system was unavailable due to entry of an LCO.

4. FTS

   The AMWTP DSA credits several aspects of the FTS as safety significant. FTS includes primarily interlocks, barcode readers at mass control areas and assay systems, and FTS software. During 2012, the FTS components associated with SCW were unavailable on one occasion due to entering an LCO. During 2013 FTS barcode readers were unavailable on three occasions due to entering an LCO and two occasions due to management discretion for potential FTS related events associated with barcode labels and associated fissile material data. During 2014 a FTS barcode reader on the south box line was unavailable for short periods on two occasions which resulted in an unplanned entry of an LCO.

5. CIDAS

   The AMWTMP DSA credits several components of the CIDAS as safety significant. For this review period CIDAS was unavailable due to entering an LCO and placing CIDAS into suspension mode on two occasions, once in 2013 caused by a detector failure and once in 2014 caused by a site power dip.

6. Confinement Boundary

   From May until August of 2012 the confinement boundary was identified as safety significant in the DSA. The confinement boundary was removed as safety significant in a DSA revision implemented in August of 2012. During the review period there were no occasions were the confinement boundary was unavailable.

7. Drum Venting Barriers

   The DSA credits the drum venting barriers in the WMF-615 Drum Vent Facility, WMF-634 Drum Vent System, and WMF-676 north/south box lines as safety significant. During the review period there were no occasions where the credited drum venting barriers were unavailable.

8. Transuranic Storage Area – Retrieval Enclosure (TSA-RE) Retrieval Contamination Enclosure (RCE) Diesel Fueling System

   The DSA credits the three-way valve and day tank/deliver piping as safety significant design features of the TSA-RE RCE diesel fueling system. During the reporting period

the fueling system was unavailable on one occasion due to an unsatisfactory configuration of a three-way valve. The requirement is that only one of two flow paths at a time can be directed through the valve. The issue was that two flow paths could occur if the valve was in the intermediate position between open and closed. An Occurrence Reporting and Processing System (ORPS) report was generated for identification and tracking, and the diesel fueling system was taken out of service until a valve that met the TSR was procured and installed.

In summary with regard to nuclear systems availability, 12 safety systems were unavailable a number of times, most instances associated with the RTR and drum assay systems. RPT-DSA-02 Rev. 9 and RPT-TSR-03, Rev. 12, implemented in August of 2012, no longer credited the RTRs as safety significant. It also included a reanalysis of the conditions that require entry into an LCO for the safety significant box/drum assay systems. This resulted in a Limiting Condition for Operation that requires LCO entry conditions more reasonably aligned with their safety function such that their availability is more reflective of the expectation for theses type of systems. Conditions resulting in the unavailability of the other nuclear safety systems are consistent with expectations.

Nuclear Safety Performance

Nuclear safety system performance is measured in terms of passed (failed) TSR surveillances. During the review period, there were 14 failed surveillances; one on an RTR machine, one on the FTS, 10 on the drum assay units, and two on the box assay unit. When surveillances are failed, actions are taken according to the associated TSR LCO.

RPT-DSA-02 Rev. 8 and RPT-TSR-03 Rev. 11 required that surveillance for RTR, drum assay, box assay, and SCWPAM systems be performed before operation, if 24 hours or more had elapsed since last successful surveillance. During this period on several occasions this prior to use surveillance was failed for reasons which were subsequently determined in RPT-DSA-02 Rev. 9 and RPT-TSR-03 Rev. 12 not related to the safety function of the systems. In preparing RPT-DSA-02 Rev. 9 and RPT-TSR-03 Rev. 12, RTRs were correctly identified as a standard industrial hazard and no longer identified as safety significant systems. Thus, the associated surveillance requirements were deleted. RPT-DSA-02 Rev. 9 and RPT-TSR-03 Rev. 12 also included a reanalysis of the conditions resulting in LCO entry conditions more reasonably aligned with the safety function of the drum/box assay systems safety significant components. Since the implementation of RPT-DSA-02 Rev. 9 and RPT-TSR-03 Rev. 12, failure of safety components during surveillances has been limited to one instance (alarm light failure on the SCWPAM), and in general is more reflective of the expectation for these type of systems.

Radiation Safety

CAMs are in operation throughout the facility and non-facility areas. None are credited safety significant components. All provide an alarm function only, with the exception of the CAMs in the storage buildings that shut down the unfiltered ventilation systems in case of alarm. For the facility area, 57 alarms were received. Of these, 13 were alarms indicating maintenance required (low flow due to filter plugging, pump issues, etc.) and 44 were real alarms attributed to temporary ventilation losses and associated increased airborne activity in the sub-change rooms. For the non-facility areas, a total of 141 CAM alarms were received. All were false, attributed to radon buildup on the filters. During this time, changes were made to CAM operation that

significantly the number of false alarms. CAM filters are changed more frequently, reducing the amount of radon buildup between changes. Alarm settings were changed from derived air concentration (DAC) at a single set point to a time weighted set point of DAC-Hour. The failure of CAMs (availability) occurs at an expected rate consistent with the industry. In case of a CAM failure, a temporary CAM is installed in its place until the permanently installed CAM is repaired.

Life Safety

The MAXIMO work planning system was sorted and reviewed for preventative and corrective work currently in the planning state. An evaluation was performed, focused on the amount of work associated with the safety systems (e.g., fire protection, CAMs, ventilation, fire extinguishers, emergency lighting) and the timeliness of work performance. Of the 306 work orders awaiting work, less than 6% are related to safety systems. There was one ventilation related work order, and it is within its normal repair cycle time. One was related to a fire water tank broken sample line, five were related to normal building lighting, and three were related to emergency lights. One was a corrective maintenance work order for emergency lights in the Retrieval building which is past its targeted work completion date. Ongoing fire extinguisher testing, including periodic inspections and testing is current.

The fire damper remote closure system in this facility is designed to operate in the automatic or manual mode. In the automatic mode, a signal from the fire alarm panel actuates (closes) fire dampers in a particular zone. In the manual mode, dampers are closed by operators at the damper control panel depending on the location of the fire. In the automatic mode, depending on the zone(s) isolated, this also results in a perturbation to ventilation flow that can result in a building ventilation system shutdown, which is undesirable from a contamination containment perspective. The decision was made early in the project to operate the system in manual, allowing a discretionary closure of the dampers in case of a fire. The issue with this method is that in case of a fire; (1) there is no direction on manual operation of the dampers, and (2) the site fire response procedure, INST-AOI-10, AMWTF Fire Response, contains an ambiguous statement that all "nonessential" personnel be evacuated from the building. But if the building is evacuated where the fire damper panel is located, remote operation of the dampers by operations personnel is not possible. Such was the case (building was evacuated) with the recent box line fire. Although individual fire dampers do close in response to heat in the ductwork, the protocol for manual damper actuation and building evacuation in case of fire needs to be developed and added to the procedure. The AMWTP Fire Marshall is aware of this issue and is evaluating several paths forward. One is to re-evaluate the necessity to always evacuate the building in case of fire and provide instructions for manual damper operation to the operators. Another is to re-evaluate the operation of the dampers in automatic. A third is to re-evaluate the original design for dampers to be remotely closed in either manual or automatic.

An open issue in the Fire System IT&M Quarterly Evaluations states that three of the Treatment Facility ventilation system fire dampers are not being tested, dampers PFD.1-730-200, 212, and 213. Data sheets in the preventative maintenance work order for Treatment Facility damper testing, WO 288997, confirm that they are not being tested. This situation has for a long period of time, no records available that these particular dampers have ever been tested. The AMWTP Fire Marshall is aware. Based on preliminary evaluation, the probable solution is to seek an exemption from testing these dampers, due to personnel hazards accessing the dampers and because there are other dampers in series with these that serve to isolate a fire.

Idaho Treatment Group, LLC (ITG) and the Department of Energy, Idaho Operations Office (DOE-ID) completed a joint assessment of the AMWTP fire protection program in February 2013. The team concluded that ITG implements a comprehensive documented fire protection program with specific programmatic elements as required by DOE Order 420.1B and implementation of fire protection related Orders, codes, and standards, with minor exceptions. Minor issues were identified regarding fire extinguisher training, obsolescence of fire protection systems and equipment, and pre-incident plans.

Conclusion

The EOC review identified two areas of concern with Life Safety. The first one is associated with three fire dampers, in the Treatment Facility, that have not been periodically tested due to their hazardous location. AMWTP recognizes this but an evaluation has never been performed to fully understand the potential impact, if any. The second concern centers on operating the Treatment Facility fire damper closure system in manual instead of automatic. The issue with the manual mode is that in case of a fire; (1) there is no procedural direction or training on manual operation of dampers, and (2) the site fire response procedure requires "nonessential" personnel evacuation making remote operation of the dampers by operations personnel impossible. The Fire Marshall is aware of these concerns.

6.0 Number of Unplanned and Spurious Safety System Actuations

Documents Reviewed

- Continuous Air Monitor Alarm History

Interviews Conducted

- Radiological Controls manager

Field Observations

- None

Narrative

The AMWTP does not have actuations associated with the nuclear safety systems in the same context as actuations in an operating nuclear facility (e.g., reactor trip, automatic feed cutoff), therefore there are no unplanned or spurious safety system actuations. At this facility a safety system actuation serves simply to halt forward movement until the condition can be corrected.

The only other safety system actuations at this location are non-safety related CAM alarms in the storage buildings that when activated shut down the unfiltered ventilation system in the associated building. There have been a number of these, but all were false and attributed to radon buildup on the CAM filters. During this time, changes were made to CAM operation that significantly the number of false alarms. CAM filters are changed more frequently, reducing the amount of radon buildup between changes. Alarm settings were changed from derived air concentration (DAC) at a single set point to a time weighted set point of DAC-Hour. CAMs in the remainder of the facility and non-facility areas are non-safety significant and alarm only.

Conclusion

The AMWTP does not have actuations associated with the nuclear safety systems in the same context as actuations in an operating nuclear facility (e.g., reactor trip, automatic feed cutoff), therefore there are no unplanned or spurious safety system actuations.

7.0 Corrective Action Process (issues management system) Items Initiated and Trend, Average Age of Open Corrective Actions Process Items (both open issues and open corrective actions), and Number of Corrective Action Process Items Overdue

Documents Reviewed

- Corrective Action Database (CARs)

Interviews Conducted

- Quality Assurance manager

Field Observations

- None

Narrative

A comprehensive review of the corrective action database, from June 1, 2012 through May 31, 2014, was completed with a focus on:

- Corrective Action process (issues management system) items initiated and trend
- Average age of open Corrective Actions process items (both open issues and open corrective actions)
- Number of Corrective Action process items overdue.

In November 2012, DOE completed a 'for cause' review of issues management and corrective actions that resulted in the determination that ITG had failed to effectively implement its issues management, corrective action and performance improvement processes, and ITG programmatic failures had contributed to the recurrence of events and injuries that should have been prevented.

DOE completed a follow up assessment of Issues Management and Corrective Actions in May 2014 with the following results:

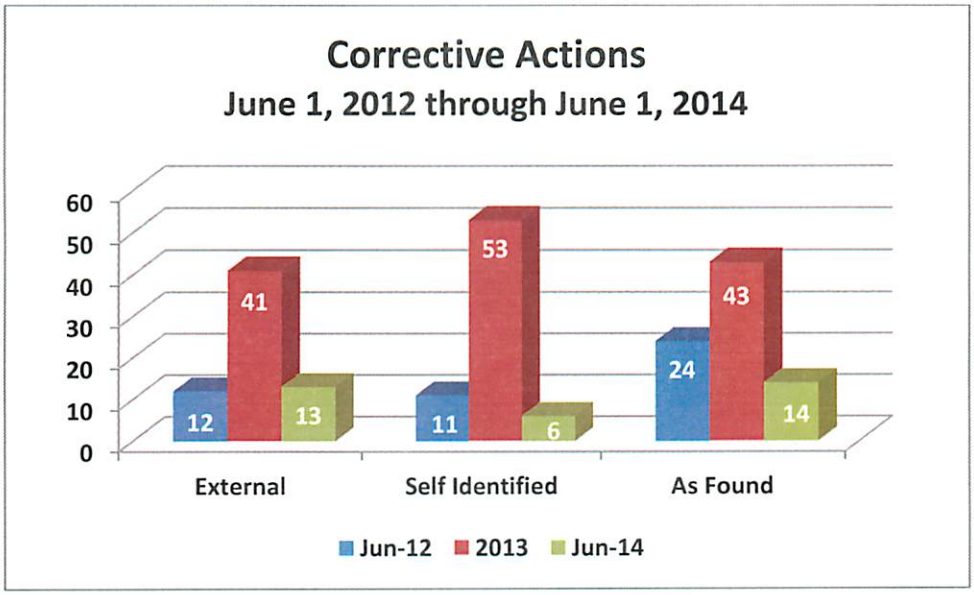
- ITG issues management and corrective action program is effectively implemented under the contract parameters
- No findings or concerns were identified.

DOE commented that they have seen improvement and that in some cases it appears procedures may include more stringent requirements than required based on the level of severity for issues. That, along with multiple external assessments performed in 2011 through 2012, appeared to be a contributing factor to effective implementation of programs and processes.

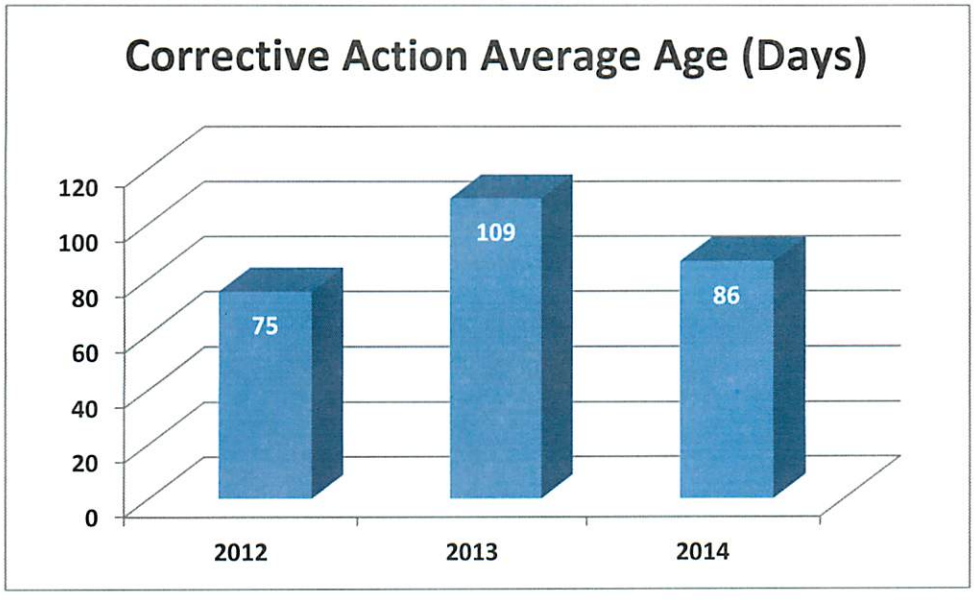
The assessment results align with ITG's previous assessment, which resulted in the Contractor Assurance System (CAS) Improvement Plan where improvement actions are in progress.

AMWTP's Corrective Action Effectiveness Index (CAEI) measures timeliness and effectiveness of corrective action implementation to reduce the likelihood of recurrence of issues and events. Based on positive trending performance in FY 2013, the CAEI monthly goal was reduced by more than half to encourage continued improvement.

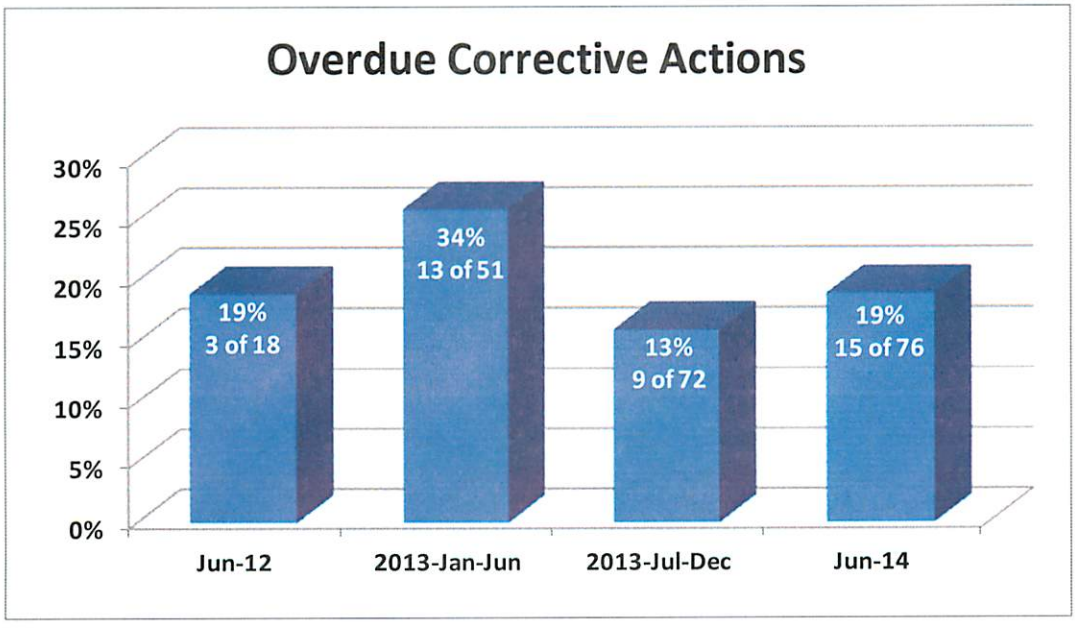
A review of the corrective action database for the previous two years determined there were 66 externally identified non-compliances; 70 self-identified non-compliances and 81 self-disclosing (as-found) non-compliances related to the operating facility.



Review of data from June 1, 2012 through June 1, 2014 identified that, on average, corrective actions were completed within 75 days while in 2013 the average time to complete went up to 109 days. Currently in 2014, completion of corrective actions averages 86 days which aligns with project procedures. This is a significant improvement from previous years where average age in excess of 300 days.



Review of data from June 1, 2012 through June 1, 2014 identified that in the last six months of 2012 and the first six months of 2013; overdue corrective actions were higher than desired. Management attention to completion of corrective actions on time shows improvement in reducing the amount of overdue actions. Of note, corrective actions that were identified as overdue generally were less than 30 days overdue. Continued management attention in 2014 is proving to provide positive results in decreasing the amount of overdue actions.



AMWTP's Corrective Action Review Board monitors corrective action implementation on a monthly basis and the needed management attention is provided to ensure continued performance improvement.

Conclusion

An assessment performed in May 2014, by DOE-ID, stated that the corrective action program is effectively implemented and had no findings or concerns. The EOC review did not identify anything that would contradict this assessment.

8.0 Number and Rate of Human Performance Errors

Documents Reviewed

- HPI data

Interviews Conducted

- Contractor Assurance System Lead

Field Observations

- None

Narrative

Using the Human Performance and Reliability data evaluated over the last two years for the quarterly ORPS report, 210 events (reportable and non-reportable), injuries, as found conditions, and assessment findings provide the following breakdown. In many cases, multiple failure modes have been identified for an individual issue.

10% - Positive Response - Performed to Expectations

40% - Failure to Recognize an Error-Likely or Abnormal Situation

64% - Latent Organizational Weaknesses

72% - Flawed or Missing Defenses

36% - Did not adequately mitigate or eliminate error precursors

27% - Skill-Based Error

46% - Rule-Based Error

< 1% - Knowledge-Based Error

14% - Not Applicable/Equipment Failures

The Human Performance Improvement (HPI) analysis of fact findings and documented events indicates that performance errors of most HPI-related failure modes are "Flawed or Missing Defenses" and "Latent Organization Weaknesses." Analysis further indicates that the failure mode "failure to recognize an error-likely or abnormal situation" is notable; but it has been improving over the last year. However, the failure mode "Did not adequately mitigate or eliminate error precursors" has increased slightly in FY 2014. In addition, evidence further indicates an overall improvement in all three Human Performance nodes related to skill-based, rule-based, and knowledge-based errors decreasing overall.

Conclusion

The EOC review of human performance and reliability data did not identify any adverse conditions or trends.

9.0 Number of Abnormal and Emergency Procedure Entries

Documents Reviewed

- Results of a facility log review in Facility
- Results of a facility log review in Treatment
- Results of a facility log review in Packaging/Shipping
- Results of a facility log review in Characterization
- INST-AOI-02, Radiological Surveillance System (RSS) High Activity Alarm
- INST-AOI-10
- INST-AOI-05, Loss of Ventilation
- INST-AOI-12, Indicated High Fissile Gram Equivalent Drum Recovery
- MP-EP&C-12.2, Emergency Initiating Conditions and ERO Activation
- MP-EP&C-12.3, Emergency Control Center Operations
- MP-EP&C-12.4, Event Categorization, Classification, and Emergency Action Levels
- MP-EP&C-12.5, Emergency Offsite Notifications
- MP-EP&C-12.6, Shift Supervisor Emergency Response Actions
- MP-EP&C-12.11, Technical Support Center Operations
- MP-EP&C-12.12, Emergency Operations Center Operations
- MP-EP&C-12.13, Re-entry
- MP-EP&C-12.14, Emergency Recovery
- MP-EP&C-12.15, Emergency Termination
- MP-EP&C-12.16, Evacuation, Shelter, and Accountability
- DOE O 151.1C, Comprehensive Emergency Management System

Interviews Conducted

- Facility Production manager

- Characterization & Storage manager
- Packaging & Shipping & MLLW manager
- Treatment manager
- Emergency Management program administrator

Field Observations

- None

Narrative

Process operating instructions used within AMWTP facilities contain a section called "Abnormal or Infrequent Operations". This section is only applicable to a specific process within a facility and is entered regularly based on the nature of the work being performed.

There are five stand-alone approved "Abnormal Operating Procedures." Four of the five have been used over the past two years.

- INST-AOI-02 is used in response to CAM alarms in the Treatment Facility. Fifty-seven alarms were received over the past two years. Of these, 13 were alarms indicating maintenance required (low flow due to filter plugging, pump issues, etc.) and 44 were real alarms attributed to temporary ventilation losses and associated increased airborne activity in the sub-change rooms.
- INST-AOI-10 was used twice in response to fires in the facility. Both were associated with the south box line.
- INST-AOI-05 was entered into nine times due to ventilation upsets within the facility.
- INST-AOI-12 was entered into once.

In September 2013, the Emergency Response Organization (ERO) was mobilized to combat a facility (WMF-676) north boxline fire. The 11 MP-EP&C procedures were utilized, as applicable, to coordinate and control activities associated with the emergency. These procedures where developed to implement the requirements contained in
DOE O 151.1C. This is the only time the ERO has been activated over the past two years.

Conclusion

The EOC review of abnormal and emergency procedures did not identify any concerns adverse to safety.

10.0 Number of Unplanned and Automatic Process Shutdowns

Documents Reviewed

- RPT-DSA-02 Rev. 10

Interviews Conducted

- Nuclear Facility manager
- Cognizant system engineer
- Nuclear Safety manager
- Plant Engineering manager

Field Observations

- None

Narrative

AMWTP does not have process shutdown systems like a nuclear material processing facility would have, such as a casting furnace that shuts down on high temperature because of a failed temperature controller.

The site does have a FTS. The FTS receives drum and box data directly from the assay systems and ensures that fissile limits are not exceeded within specific areas of the facility. When a container is assayed, its ID and fissile content are passed to the FTS. The system provides the "enable' signal to AMWTF conveyor motors to allow movement of an item. The FTS interfaces with interlocks to prevent the movement of boxes or drums into these areas unless an acceptable total fissile content is confirmed and within limits.

Actuation of the FTS interlock stops movement of an item (drum or box) on the conveyor system. It does not shut down any process but it does alert operations to a situation that needs to be addressed.

The only other safety system actuations are with CAM alarms in the storage buildings that when activated shut down the unfiltered ventilation system in the associated building. There have been a number of these, but all were false and attributed to radon buildup on the CAM filters. CAMs in the remainder of the facility and non-facility areas are alarm only.

Conclusion

AMWTP does not have any automatic process shutdown equipment like a nuclear material processing plant would have. A process interruption interlock exists to alert operators of an abnormal condition that needs resolution. The EOC review did not identify any concerns with this factor.

11.0 Number of Procedure Non-Compliance Events

Documents Reviewed

- Corrective Action Database

Interviews Conducted

- None

Field Observations

- None

Narrative

A review of the corrective action database for the previous two years determined that there were 55 procedure non-compliance events related to the operating facility. A CAR was issued for each event. Of those, 38 were attributed to human performance errors and 17 were attributed to written communication errors (e.g., procedure approval without proper comment resolution, failure to complete inspection form properly). Action items have been completed and all of these CARs have been closed with the exception of five. Of these, two have actions complete and are awaiting QA verification prior to closure of the CAR, and three that are awaiting the completion and verification of action items. There is a continued focus via the various assessment and observation programs to identify and keep procedure non-compliances to a minimum.

There is a recognized need for improvements to the Management Observation Program (MOP), particularly to improving the focus of the MOP tours and the collection of data. An element of the program is for managers to observe procedures being executed in the field with focus on compliance. Revisions to the controlling procedure have been completed and training is being implemented. The MOP database is being re-written to allow for human performance trending and to simplify the data entry process for managers.

Conclusion

The EOC review concluded that non-compliance events are being identified and tracked by the corrective action program through closure. ITG identified a weakness in the Management Observation Program related to the observation of procedure execution and compliance. Corrective actions have been identified and are being implemented to correct this weakness. No additional concerns were identified by the EOC review.

12.0 Number and Age of LO/TO Hanging

Documents Reviewed

- INST-COPS-9.20.1, Lockout/Tagout, Rev. 3
- MP-COPS-9.21, Control of Operations Locks, Rev. 6
- MP-COPS-9.7, Control of Equipment and System Status, Rev. 18
- INST-COPS-9.7.1, Caution and Out-of-Service Tags, Rev. 2
- Caution/OOS Tags – AMWTP Home Page
- Non-Facility Operations Locks Logbook

Interviews Conducted

- Nuclear facility manager
- PSM

Field Observations

- None

Narrative

Lockout/Tagout Program

AMWTP has two lockout/tagout binders, one is applicable to the facility (WMF-636) and the other covers all non-facilities. The non-facility binder is maintained in the PSM office. On May 18, 2014 there were four active Lockout/Tagouts (LO/TO) in effect. Three were in the facility supporting maintenance repair and inspections and were less than 45 days old. There was one active LO/TO in the non-facility binder supporting installation of a new conveyor, which has been hanging since September 18, 2013. A recent decision was made not to install this new piece of equipment so this tag will be removed.

Caution and Out-of-Service Tags Program

INST-COPS-9.7.1 is the governing document for use of these tags. The Precautions and Limitations section of the procedure states that:

- Caution tags shall be used as a temporary means of warning employees of an existing hazard and equipment deficiencies,
- Out-of-service tags shall be used as a temporary means to restrict operation of equipment, and
- Caution tags and/or out-of-service tags shall not be used for personnel protection.

A review of the Caution/OOS Tags database identified thirty-nine open caution tags and forty-one open out-of-service tags. The table below breaks down the 80 active tags by age.

Age	Caution Tags	Out-of-Service Tags
> 4 yrs	1	0
> 3 yrs but < 4 yrs	2	2
> 2 yrs but < 3 yrs	17	3
> 1 yr but < 2 yrs	2	3
> 180 days but < 1 yr	2	7
> 90 days but < 180 days	3	5
< 90 days	12	21
Total	39	41

INST-COPS-9.7.1 requires the "appropriate operations manager" to perform an annual assessment of responsible area(s) to determine accountability for caution and OOS tags in service and those that have been removed from service. Completion of this assessment shall be documented in TrackWise as a management assessment report (MAR). A review of TrackWise indicated the last assessment was performed in April 2012.

Of the thirty-nine open caution tags, seventeen are used in conjunction with an operations lock to explain why the operation lock is in place. The requirement to have a caution tag accompany an operations lock was eliminated in a recent revision to MP-COPS-9.21. The remaining caution tags are in place for various reasons.

- To control of the use of equipment
- To establish conditions for performance e of processes
- To recognize that training must be completed prior to operating a piece of equipment.

Of the 41 out-of-service tags, twenty are greater than 90 days old. MP-COPS-9.21 states that Engineering and Operations should determine if equipment will not be repaired/returned to service, and if not, that a permanent placard be attached to the equipment and the OOS tag removed.

Operations Locks Program

MP-COPS-9.21 is the governing document for use of these locks. The general requirements section of the procedure states that operational locks can be used to:

- Prevent operation of equipment that is no-operational and needs to be controlled to prevent potential for equipment damage

- Prevent the inadvertent operation/movement of equipment that is operational, provided the operations lock is a *break-away lock*

- Prevent access to sensitive equipment.

The purpose of the procedure is to establish uniform control for using and tracking *operational locks* and keys. A lock and its corresponding key are marked with the same number. Two log sheets are maintained in a logbook, The "Key Accountability Log" documents the approval to check out a key to a specific individual and the" Operations Locks Status" documents the lock number, the location of the installed lock, the reason for the lock, the approval to install the lock and date the lock was installed. The logbook indentified installed locks dating back to September 2007.

A review of the Non-Facility Operations Locks Logbook identified the following.

- Logbook was last reviewed July 9, 2012

- Key 57 was checked out on April 20, 2014 – lock was installed until May 27, 2014

- Lock 58 was installed on May 8, 2014 – Key 58 was not checked out

- Lock 26 was installed on May 8, 2014 – no corresponding log sheet for Key 26

- Lock 3 was installed on May 8, 2014 – Key 3 was not checked out

- Lock 2 was installed on May 8, 2014 – Key 3 was not checked out

- Lock 86 was installed on May 8, 2014 – Key 86 was not checked out

Conclusion

The review identified that the LO/TO program is procedurally compliant and rigorously administered.

The Caution and Out-of-Service Tags program and Operation's Locks program need further evaluation, with a focus on program administration. The intent of the Caution and Out-of-Service Tags program was to provide a temporary means to warn employees or to restrict operation of equipment. At some point the need for the warning or restriction should be evaluated for a permanent disposition. The Operation's Lock program needs to be evaluated and/or reviewed to ensure the controls are being effectively implemented.

13.0 Number and Age of Temporary Modifications

Documents Reviewed

- Temporary Physical Change (TPC) database
- Temporary Software Override (TSO) database

Interviews Conducted

- None

Field Observations

- None

Narrative

There have been 28 temporary physical changes (TPCs) utilized over the past two years. In general, there are three categories of use identified for these TPCs. Eleven were installed to assist in troubleshooting efforts. In all of these cases, this was necessary to apply power to field devices such as photo-eyes, proximity switches or reed switches which are located in cell and required to be energized for troubleshooting, but were de-energized along with the rest of the equipment when an entry is made. Eight were installed in order to accommodate troubleshooting associated with cell 335 lidding device. Four were in support of facility ventilation system instrument calibrations to ensure testing would not shutdown ventilation. These TPCs override hardwire trip circuits and allow for checking the full range of the instruments. The remainder was to allow continued operation of equipment after component failure until permanent repairs had been performed. Of note was one on a Fire Panel which had a trouble alarm due to backup batteries having low voltage. A temporary backup battery system was utilized to make the panel operable until new batteries were installed. Another TPC removed an interlock on a floor safety mat next to a conveyor. This was needed due to a failed controller and was installed to allow continued operation of the conveyor. This removed a safety feature, but was justified by adding an administrative control requirement to utilize a Lockout/Tagout (LOTO) for entrance into the area (WMF-615 Silo). Another TPC was to install a temporary cover over a cracked Super Compactor glove box window to ensure containment was maintained until the window could be replaced.

There have been 240 temporary software overrides (TSOs) requested in the last two years. Of these, 45 were unapproved (never installed due to not meeting criteria or no longer needed). All have been cleared, with the exception of four currently installed in plant. All were properly reviewed and approved prior to installation and were tracked through removal and closure. A common use of TSOs was to enable the performance of calibrations on ventilation systems software or to assist in maintenance troubleshooting (accounted for 62). These were typically used for troubleshooting by inhibiting ventilation shutdown alarm set-points to allow full range exercise of instrument and alarm set-point verification. Another use was to allow operations to toggle photo-eyes due to misalignment or dirt accumulation on reflectors (accounted for 37). The remainder was on a variety of plant equipment requiring maintenance, generally to allow for continued waste movement through the facility until repairs could be made. One TSO inhibited an equipment emergency stop circuit (E-stop button), but this was an in cell where no personnel

were present with running equipment. This was installed long enough to perform equipment repairs. Review of the database concluded that life safety equipment was never put in a condition where features were bypassed and compensatory measures not taken.

Conclusion

The EOC conclusion is the TPCs and TSOs are installed as expected as a normal part of plant operations and maintenance. However, they are being properly approved and effectively tracked for their locations installed in the plant and through removal and closure.

14.0 Number and Age of Inoperable Safety Systems

Documents Reviewed

- TSR Surveillance database
- MAXIMO Work Tracking System
- Radiological Controls Supervisor Logs

Interviews Conducted

- Radiological Controls manager
- Fire Systems engineer

Field Observations

- None

Narrative

Safety systems at the AMWTP include the nuclear safety systems (safety significant SSCs), fire safety systems, and continuous monitoring systems (CAMs). These systems become inoperable when they are needed for plant operations, but cannot perform their function because of equipment issues requiring maintenance, failed testing, or in the case of the safety significant SSCs, failed surveillances.

Regarding inoperability of the safety significant SSCs, there were 14 failed surveillances; one on a RTR machine, one on the FTS, 10 on the drum assay machines, and two on the box assay machines. This required entries into Limiting Conditions for Operations (LCOs) and the performance of associated Action Statements as an element of recovery. Problems were experienced with 12 of the RTR systems and the drum assay systems, rendering them unavailable for use an inordinate number of times. Changes to the safety basis were made (RPT-DSA-02 Rev. 9 and RPT-TSR-03 Rev. 12) as the result of reanalysis, resulting in no longer crediting the RTR systems as safety significant, but as a standard industrial hazard. Thus, their surveillances were deleted. Changes also resulted in a LCO for the drum/box assay systems that is more reflective of their function. Since the changes were made, failure of these components during testing has been limited to one instance, which is more reflective of expectations for these systems. Conditions resulting in the operability of other safety significant SSCs are consistent with expectations.

Fire safety systems that have become inoperable due to maintenance issues and failures during routine testing are corrected on a priority basis. As an interim measure, fire system impairments are generated that track the issue and direct any compensatory measures. An assessment of the Impairment Program is conducted quarterly, evaluating attributes such as the number of active impairments, length of time they are carried until closure, and trends. An electronic system notifies the AMWTP Fire Marshall in case of extended impairments or those becoming overdue for closure. Evaluations of the fire system inspection, testing, and maintenance program are conducted and a report is published quarterly, and has concluded that the fire protection program is being implemented satisfactorily. A comprehensive internal review of the program is done

annually, the most recent in February of 2013. The review concluded that program elements of DOE Order 420.1B, are being implemented with minor exceptions. The ITG/DOE joint assessment of the fire protection program conducted in 2013 reached the same conclusion.

The CAMs in facility and non-facility areas become inoperable at a rate consistent with the industry. When this occurs, a temporary CAM is placed in service in order to continue the function. As mentioned in other sections of this report, the CAMs at AMWTP provide an alarm function only, with exception of the non-safety significant SSC CAMs in the storage buildings that serve to shut down the associated unfiltered ventilation system in case of alarm.

Conclusion

The EOC review did not identify any issues or concerns with inoperable safety systems. When problems arise they are analyzed and addressed in accordance with governing documents.

15.0 Number of Temporary Procedure Changes

Documents Reviewed

- Electronic Document Management System (EDMS) change data for the previous two years

Interviews Conducted

- Document Control manager

Field Observations

- None

Narrative

Temporary procedure changes are not used at AMWTP with the exception of analytical chemistry lab procedures (a less than Category III facility). Changes to procedures in the operating facility include revisions and field changes, both receiving the appropriate review and approval prior to issuing to the field. Field changes are issued when a procedure cannot be followed as written, or due to an unanticipated operational and/or maintenance condition that might stop work or cause it to be unreasonably delayed. Field changes are not used when the change affects a DSA or Resource Conservation Recovery Act (RCRA) requirement, introduces a hazard that has not been previously addressed, would remove a hold point, or would necessitate a software change. The document control process places a limit to five field changes against a procedure after which they are absorbed as a procedure revision that undergoes an additional round of review.

Document change history obtained from the EDMS system for the past two years indicates that there were 127 field changes made to procedures, 78 in 2012 (following the ITG transition in 10/2011), 36 in 2013, and 13 in 2014. There are currently 56 procedures in the plant that contain field changes. This is deemed acceptable because all of the field changes are properly approved, and by definition is part of the already approved revision of the procedure.

Conclusion

Temporary procedure changes are not used at AMWTP with the exception of analytical chemistry lab procedures (a less than Category III facility). Changes to procedures in the operating facility include revisions and field changes, both receiving the appropriate review and approval prior to issuing to the field. The review did not identify any concerns with this factor.

16.0 Number of Grievances

Documents Reviewed

- Labor Relations review
- Ethics and Compliance review

Interviews Conducted

- None

Field Observations

- None

Narrative

All labor relations and employee concerns were reviewed over a two-year period of time. Due to the sensitivity of the data, these records are not included in this report, but are available upon request. Data reviewed to ensure no "production over safety" issues have been communicated via these channels. None were discovered.

Conclusion

No issues or concerns were identified by EOC review.

17.0 Management Observation System Data, Number of Observations by Senior Managers, Number of Management Observations that Identify Deficiencies and Result in Corrective Actions

Documents Reviewed

- MOP data
- Quarterly ORPS reports
- Charters from the Plant Review Committee (PRC), Corrective Action Review Committee (CARB) and the Collective Significance Review

Interviews Conducted

- None

Field Observations

- None

Narrative

Senior manager field observations are recorded as work site visits, the numbers and resulting corrective actions are combined with MOP data discussed in Section 18.0, Assessments and Observations.

In addition to work site visits, senior managers perform observations through their review of the Quarterly ORPS Report, performed as an evaluation of ITG's performance during the current quarter against the preceding four quarters. The report is delivered to the Department of Energy. The evaluation includes an analysis of ORPS reports, non-reportable events, injuries/illnesses, industrial and nuclear safety issues, and CARs identified by assessments. The analysis allows priority to be placed on the resolution of ongoing issues, as well as preemptive action to be taken with regard to anticipated issues.

Observations are also made through senior manager participation in various boards and review committees such as:

- CARB – Reviews CARs that have significant adverse to quality, root cause analysis reports, MARs, and other selected assessments to ensure appropriate focus and adequacy of corrective actions
- PRC – Provides oversight of critical plant activities such as review of complex or high hazard maintenance work packages, initial revisions of plant operating procedures, changes to safety basis documents, readiness assessment plans and assessment results, and other significant topics included in the PRC charter and determined by the plant manager

- Safety Performance Objectives, Measures, and Commitments (SPOMC) – Reviews the quarterly issued SPOMC Report to assess meeting Integrated Safety Management System (ISMS) requirements

- Collective Significance Review – Periodic reviews organized by Contractor Assurance and represented by a cross section of functional areas to evaluate input data from any source for collective significance.

Conclusion

A sampling of data suggests that senior documented manager visits to the field are below expectations and improvement is needed. In calendar year 2013, 53 percent of senior managers participated on a monthly basis. In calendar year 2014 to date, 25 percent of senior managers participated on a monthly basis. The ITG President is establishing expectations for performance and frequency, and progress towards improvement will be monitored. No additional concerns were identified by this review.

18.0 Assessments and Observations Done, Number That Identify Deficiencies and Results in Corrective Actions

Documents Reviewed

- Management Observation Program (MOP) reports and corresponding data
- Management Assessments and corresponding data

Interviews Conducted

- None

Field Observations

- None

Narrative

Over the past two years there were 5,233 MOP tours conducted at the AMWTP that generated corresponding reports and data. The tours were focused primarily on plant operations. Of those, there were 592 observations that resulted in performance gaps and deficiencies. These were either corrected on the spot between the observers and workers, entered as action items into the site tracking system (TrackWise) for documentation and record of closure, or determined to be conditions adverse to quality for which CAR were generated.

There is a recognized need for improvements to the MOP, particularly to improving the focus of the MOP tours and the collection of data. The shift in focus concentrates on providing an effective means of removing barriers for a safe and productive work environment, creating positive interactions between workers and managers, emphasizing quality observations versus quantity, and the identification of meaningful opportunities for improvement. Revisions to the controlling procedure have been completed and training is being implemented. The MOP database is being re-written to allow for compliance and human performance trending and to simplify the data entry process for managers.

In addition to the MOP, there were 210 Management Assessments conducted over the past two years. As a result, 588 action items were entered into the TrackWise system and 15 CAR were generated. This indicates these assessments are identifying a limited number of noncompliance conditions and a larger number of improvement and action items. The assessment schedules are prepared in advance and contain the timing for the assessment as well as a predetermined scope. In addition, assessments are performed as concerns may arise, focused on potential risks that could have an impact on the project.

Conclusion

The EOC review did not identify any new concerns or issues with this factor. A weak area, associated with the Management Observation Program exists which was previously discussed in Section 11.

19.0 Number of Personal Contamination Events and Personal Chemical Exposure Events

Documents Reviewed

- Various Management Reviews (MR), Fact Findings (FF), and RadCon Supervisor Logs
- Interoffice Memorandum INST-OI-114 Operations RR-002-13 (C-2013-0239), Analytical Results from Collection Container #10483900

Interviews Conducted

- Radiological Controls manager

Field Observations

- None

Narrative

Personal Contamination

There have been nine instances where radioactive skin contaminations have been received in the past two years, of which two were ORPS reportable and seven were ORPS non-reportable. None were due to program issues but were either accidents in contaminated areas or material failures which have been recognized and corrected.

Chemical Exposure

One minor chemical exposure has occurred in recent history, on April 1, 2013. Four workers were performing a drill and drain operations in the Drum Re-Overpacking Facility (DRF) according to approved procedures and wearing approved respiratory equipment (powered air purifying respirators with combination cartridges). The operation removes excess liquids from collection containers of sludge waste in order to make them shippable to an off-site disposal facility. During the process, the workers smelled pungent ammonia like odor inside their hoods and experienced irritation of their mucous membranes (eyes, nose, and throat). The workers exited the DRF, proper notifications were made, and the workers were sent to the AMWTP Medical Coordinator for evaluation. The workers exhibited normal vital signs and denied any respiratory or breathing symptoms. The workers then reported that they were no longer experiencing mucous membrane irritation, but they had mild headaches and one complained of some nausea. The staff doctor was consulted and determined that further evaluation was not warranted.

Following the incident, samples were taken from the collection container and sent to an off-site lab for analysis. Information from the analysis could not be correlated to actual exposure; therefore a definitive ammonia airborne concentration (short term or time weighted average) to which the workers were exposed could not be established. The odor of ammonia is strong, pungent, and able to be detected by smell for most people at low concentrations, and exposure to low concentrations would naturally create a health concern. However, based on published

toxicology data, the workers were likely exposed to a level of ammonia low enough to allow the body to remove it and not cause temporary or permanent injury.

This incident was below the threshold of ORPS reporting criteria.

Conclusion

The EOC reviewed data associated with contamination and exposure events and did not identify any concerns. Events over the past two years have been recognized, analyzed and corrected as required by governing programs.

20.0 Configuration Management Changes

Documents Reviewed

- Facility Modification Proposal (FMP) data

Interviews Conducted

- None

Field Observations

- None

Narrative

Engineering change management is controlled utilizing the Facility Modification Proposal (FMP) process. In the last two years, 193 FMPs were generated. Of those, 15 were reviewed and the proposed changes never installed in the plant. The introduction of new equipment or production processes is associated with 42 of the FMPs, developed to accommodate specific waste streams that were problematic or to facilitate process improvements. Of these, four resulted in or are in the process of requiring changes to the DSA:

1. The introduction of a Handheld Barcode Reader for WMF-634 drum assay components that were added as safety significant items.

2. The processing of aerosol cans in box lines, the modification currently being submitted to RPT-DSA-02 to recognize this practice being performed in a DSA recognized safety significant venting barrier.

3. Retrieval Box Assay System certification to allow box certification for shipment. This will result in addition of hardware that will be considered safety significant due to location on existing safety significant equipment. This is still in development and will be addressed in RPT-DSA-02 pending revision.

4. The addition of a shield to the box line suit preparation room windows. This added protection to the DSA recognized safety significant venting barrier.

Other FMP initiated changes include nine associated with equipment that has been removed from service. The remainder of the 127 FMPs generated through this period was for upgrading existing equipment or refitting equipment due to obsolete spare parts.

Conclusion

The EOC reviewed the Facility Modification Proposal (FMP) process and found it compliant in controlling configuration control. No issues were identified.

21.0 Review of All Safety Basis Changes Over the Last Two Years That Resulted in Downgrading any Controls

Documents Reviewed

- RPT-DSA-02 Rev. 8
- RPT-DSA-02 Rev. 9
- RPT-DSA-02 Rev. 10
- RPT-TSR-03 Rev. 11
- RPT-TSR-03 Rev. 12
- RPT-TSR-03 Rev. 13
- Nuclear Safety Technical Basis-81144, Evaluation of the Safety of the Situation for Fire in the Treatment Facility North Boxline West Trough
- Nuclear Safety Technical Basis- 78458, Evaluation of the Safety of the Situation for High PEC Containers

Interviews Conducted

- None

Field Observations

- None

Narrative

A two-year comprehensive evaluation focused on controls removed or downgraded as a result of changes to the safety basis documents was completed. RPT-DSA-02 Rev. 8 and RPT-TSR-03 Rev. 11 were the controlling documents at the beginning of the review period. The chart below identifies the controls removed or downgraded and the basis for such action.

DSA/TSR Rev	Change	Basis
RPT-DSA-02 Rev 9, RPT-TSR-03 Rev 12	Removal of Confinement Boundary as Safety Significant and associated LCO/SAC	The evaluation guideline for safety class and the evaluation criteria for safety significant are not challenged; therefore no safety-class or safety-significant SSCs are required. A defense-in-depth commitment to the SMPs identified in Chapter 5 is made for worker protection. In particular, the SMPs ensure workers are trained to evacuate the immediate area following a fire event.

DSA/TSR Rev	Change	Basis
	Removed LCO for TSA-RE Free Fossil Fuel Limit	Replaced with SAC for fossil fuel limits.
	Removal of RTR systems as safety significant systems.	Real-Time Radiography systems are considered a standard industrial hazard.
	Removal of SAC for Supercompactor Squeezant Handling,	Operational history and criticality safety evaluations have shown that it is beyond extremely unlikely that an excessive accumulation of supercompactor squeezant liquor accumulate in the supercompactor glovebox, or present a fissile material handling concern. Supercompactor squeezant handling remains a criticality working requirement.
	Removal of SAC for Confinement Boundary Entry	Although operations within the confinement boundary are undertaken remotely, occasional personnel entry for maintenance and repair is needed. Involved workers whom enter the passive AMWTF confinement boundary are protected by the worker safety controls established by conduct of operations, radiation protection, and Industrial Safety/Industrial Hygiene (IS/IH) programs, in addition to other defense in-depth safety management programs.
	Removal of SAC for AMWTF Confinement Hot Work Restrictions	Although operations within the confinement boundary are undertaken remotely, occasional personnel entry for maintenance and repair is needed. Involved workers whom enter the passive AMWTF confinement boundary are protected by the hot work restrictions established by the Fire Protection SMP.
	Removal of SAC for respiratory protection inside temporary confinement structures	Respiratory protection for worker safety is established and maintained by Radiological Safety and IS/IH.
	Removal of SAC for liquid volatile organic compound limit inside temporary confinement structures	Respiratory protection for worker safety is established and maintained by Radiological Safety and IS/IH.

DSA/TSR Rev	Change	Basis
RPT-DSA-02 Rev 10, RPT-TSR-03 Rev 13	Removal of SAC for minimum staffing	Nature of Process (systems cannot be operated without staffing present).
	Removal of drummed waste handling enclosure (DWHE) specific interlock termination and FTS barcode reader as safety significant SSCs and designation of DWHE mass control area designation.	In order to support the Treatment Facility Unoverpacking Project (TFUP), the DWHE, previously controlled by the FTS, has been downgraded from a mass controlled area (MCA) to accommodate one-at-a-time drum processing. Therefore, cumulative fissile throughput controls are no longer necessary.
ESS - Fire in the Treatment Facility North Boxline West Trough (NSTB-81144)	Relieved operational restrictions for boxline operations	The completed analysis in ESS concluded that increased frequency of fire events did not result in an increased level of risk that would require TSR level controls beyond those in the existing DSA and TSRs.
ESS for High PEC Containers (NSTB-78458)	Removed operational restrictions for high PEC boxes.	The completed analysis concluded that High PEC boxes did not result in an increased level of risk that would require TSR level controls beyond those in the existing DSA and TSRs.

Conclusion

The basis for removal of controls was reviewed at length through AMWTP and DOE-ID Nuclear Safety basis change approval process. The removal or downgrading of safety basis controls has:

- Not created any issues
- Not placed personnel into an unsafe condition
- Not experienced increase risk in the nuclear safety posture at AMWTP.

Annual assessments and interaction with line management and operations personnel will continue to evaluate the effectiveness of these control changes.

No issues or concerns were identified through the EOC review.

Attachment 2
C-2014-0212
June 19, 2014

Idaho Treatment Group
AMWTP Extent of Condition Review on Deferred Maintenance

Management Assessments for Determination of Path Forward for Each Area

MAR ID. No.	Title	Responsible Department	Functional Area
86737	WIPP Extent of Condition Review on Deferred Maintenance - Work Control Organization	Plant Manager	Operations
86738	WIPP Extent of Condition Review on Deferred Maintenance - Maximo Data Administrative Clean-Up	Plant Manager	Maintenance
86739	WIPP Extent of Condition Review on Deferred Maintenance - Integrated Control System Alarms	Plant Manager	Environmental Compliance
86740	WIPP Extent of Condition Review on Deferred Maintenance - Control of Fire System Dampers	Plant Manager	Engineering
86741	WIPP Extent of Condition Review on Deferred Maintenance - Facility Readiness: Outdated/Difficult to Maintain Equipment	Plant Manager	Operations
86742	WIPP Extent of Condition Review on Deferred Maintenance - Caution Tags, Out of Service Tags, Operations Locks	Plant Manager	Nuclear Facility Management
86743	WIPP Extent of Condition Review on Deferred Maintenance - Fire System Dampers Testing	Plant Manager	Engineering