

Department of Energy

Washington, DC 20585 December 20, 2010

The Honorable Peter S. Winokur Chairman Defense Nuclear Facilities Safety Board 625 Indiana Avenue, NW, Suite 700 Washington, DC 20004-2901

Dear Mr. Chairman:

On September 23, 2010, you forwarded an evaluation performed by your staff of activitylevel work planning performed by CH2M Hill Plateau Remediation Company (CHPRC) at Hanford. Your letter requested a report outlining actions taken or planned by Environmental Management (EM), the Richland Operations Office (RL) and CHPRC to address the work planning and control deficiencies detailed in your staff's report.

Department of Energy (DOE) Headquarters, DOE-RL and CHPRC have taken action to address the issues identified in the report. The enclosure to this letter provides an overview of the actions planned or taken by CHPRC in response to the work planning and control issues identified by your staff. I am confident that these actions will strengthen the work planning and control program and overall Integrated Safety Management (ISM) implementation at CHPRC.

In addition to the CHPRC actions, DOE-RL has been monitoring CHPRC work control implementation throughout 2010. Recent formal oversight has been documented in Core Surveillances completed in August 2010 and the recently completed ISM System review performed at the Waste Retrieval Project. In addition, DOE-RL has been closely monitoring phase 1 implementation of the CHPRC revised work planning process at 100-K. Routine discussion of CHPRC work control is addressed by DOE-RL management in the monthly Contractor Assurance System metrics and trend evaluations. DOE-RL and CHPRC are participating in the Energy Facilities Contractor Group (EFCOG) Work Management Subgroup to facilitate cross-fertilization and opportunities to benefit from complex-wide best practices in work management.

In your letter you state that the Board believes that improvements to work planning and control would benefit if a technical standard for work planning and control and a guide were issued in the Department's directives system. EM and the National Nuclear Security Administration are working with the EFCOG work management subgroup on a Work Planning and Control Improvement Project to further incorporate best-management practices from the Institute of Nuclear Power Operations and other sources. The Project Plan was finalized at the EFCOG meeting during the week of November 29, 2010, and is expected to be approved by the Work Management Standards Executive Steering Committee in December 2010. As you are aware, EM issued Work Planning and Control



Guidelines on April 7, 2010, to all EM field sites. These guidelines serve as EM's minimal expectations implementation of work planning and control programs.

If you have any questions, please contact me or Kenneth G. Picha Jr., Acting Deputy Assistant Secretary for Safety and Security Program, at (202) 586-5151.

Sincerely,

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Inés R. Triay Assistant Secretary for Environmental Management

Enclosure

ENCLOSURE

CHPRC-1003648A R2 CONTRACT NUMBER DE-AC06-08RL14788

CHPRC'S PLANNED AND EXECUTED ACTIONS J. C. Hoffman

Consisting of 10 pages, including this cover page

Overview of Actions

CH2M Hill Plateau Remediation Company (CHPRC) noted weaknesses in existing work management processes at contract transition in October 2008; several enhancements were instituted at contract change and thereafter. These enhancements included:

- Instituting Hazard Review Boards (PRC-PRO-WKM-40004 *Hazard Review Board*) for higher hazard work.
- Training 900 supervisors and key personnel in Integrated Safety Management System (ISMS) implementation, Human Performance Improvement, and work management processes as part of a *Safety Leadership* initiative.
- Providing more visibility to the work management program manager through CHPRC's organizational structure.

Additionally, CHPRC recognized that the existing work management process was originally developed to support operations and maintenance of facilities. The existing work management process did not effectively account for increasing construction project or Decontamination & Decommissioning work. The work management process was observed to not align well with the ISMS Core Functions in layout and process structure. Overall complexity of the program procedures was also considered to be a contributing factor regarding compliance issues.

CHPRC initiated efforts to improve and enhance the work management process as a corporate priority following Department of Energy's (DOE) ISMS Phase II verification. Previous assessments results on work management, both internal and external, aligned with CHPRC's concerns about the existing work management processes.

DOE-RL issued the *Plateau Remediation Contract Integrated Safety Management System Phase II Verification* (DOE/RL-2010-26) in February 2010 as the report of their verification of CHPRC's ISMS implementation. The report identified four CHPRC-wide concerns, six concerns specifically about waste retrieval activities, and twenty three Opportunities for Improvement (OFIs).

Three of the CHPRC-wide concerns and several of the OFIs were related to the work management process. The concerns were related to Hazard Analysis and Controls, Feedback, and work package consistency. A common cause analysis conducted by CHPRC identified a pattern of work management weaknesses; a root cause analysis and corrective action plan were developed to address the identified issues.

DOE-RL issued a letter (10 OOD-0050; *CH2M HILL Plateau Remediation Company* (*CHPRC*) Failure to Meet Minimum Safety Performance Requirements) detailing conditions and incidents that indicated significant programmatic issues within CHPRC; among those listed were three issues concerning ISMS implementation and the Waste Retrieval Project, inadequate hazard controls resulting in worker exposure to nitric acid at the Plutonium Finishing Plant (PFP), and inadequate work planning in several ventilation

system upsets at PFP. CHPRC PFP management declared a 'Recurrence' Occurrence Report in August 2010 (SC-R) based on repetitive failures in several key management systems, including hazard identification and controls.

CHPRC considered these and other identified issues in the development of enhancements to CHPRC's work management processes. CHPRC's changes to the process include actions aimed at improving specific areas:

- 1) Walkdown documentation;
- 2) Subject Matter Expert (SME) input into the hazard and hazard control identification;
- 3) Incorporating hazard controls into work instructions;
- 4) Designating a Responsible Manager to be responsible for work from beginning to end;
- 5) Developing new work instruction templates to provide consistency of application and minimize errors;
- 6) Reinforcing expectations for work package use at the worksite; and
- 7) Identifying and conducting training on the enhanced process to work planners, responsible managers, and other personnel conducting work.

*These changes are referenced by number in the following table where appropriate.

The key elements of these changes are:

Designating a Responsible Manager

This is a new concept for the existing work management process. Identifying a line manager who is responsible for the work from its inception to completion provides continuity of purpose and understanding throughout work planning and execution. The Responsible Manager oversees work planning, work execution, and any required changes; the Responsible Manager ensures coordination among the planner, work planning team, and field work supervisor for the task. This promotes consistency as well as compliance with requirements. Responsible Managers are selected by project vice presidents, and then undergo training and qualification for their role. This allows senior management expectations for safety and compliance to flow directly into the work management process.

Changed Expectations for Hazard Controls Incorporation

The changed expectation for CHPRC's new work management process is that identified Hazard Controls Beyond Skill-Based will be explicitly incorporated into work instructions unless there is a technical justification not to include them. Current practice has been to assemble the applicable hazard controls as a set and then select from those which will be explicitly incorporated. The new expectation changes the focus by requiring a decision to *exclude* rather than a decision to *include* the controls with focus on the format of the controls as they align with specific tasks in the work instructions. This will improve SME engagement as well as help ensure that the necessary level of detail is included in hazard analysis and work instructions.

New Templates for Work Instructions

Focusing on two templates rather than the multiple variations currently used provides more consistency for planners and workers. The new templates are designed to reduce the administrative burden of developing and using the work instructions as well as driving all work to be captured in the Job Control System to improve reporting and analysis of work completion and trends. The two templates (a 'long form' for complex work and a 'short form' for lower risk tasks) streamline the administrative process while providing a clear work flow approach to documenting the work planning and approvals.

CHPRC initiated a phased implementation of these program changes, starting in a single project on October 18, 2010. This approach allows CHPRC to evaluate the effectiveness of the changes and provide focused oversight and mentoring for the new procedures and processes. That near real time evaluation will be used to improve the procedures and processes intended for implementation throughout CHPRC in February 2011. The lessons learned both about the process and the implementation process itself will aid in a smooth transition to the enhanced work management program across CHPRC.

As part of the implementation at the first project, CHPRC provided training on the changed program elements, roles and responsibilities, and fundamentals of work management. SME, work planners, field work supervisors, and workers received detailed briefings on the changes to the process and reinforcement in their roles and responsibilities. The project Vice President designated Responsible Managers (a new role for the work management process); those individuals were indoctrinated in the process and the expectations for their performance. Phase II implementation will require the same level of training across all the projects including incorporation of lessons learned from Phase I as well as updates to all the related training programs to ensure that the program requirements and management expectations are clearly understood long-term.

Feedback sessions for the first phase of implementation have already generated administrative changes in how the changed process will be implemented which is currently scheduled for February 2011. Additional observations and feedback will be evaluated for process changes as it is collected. The current plan includes an assessment during Phase I in December 2010 to evaluate progress of the implementation against desired objectives and these results will be utilized to ensure necessary adjustments are incorporated prior to proceeding to Phase II. The follow-on efforts to ensure effective implementation beyond Phase II will be accomplished through targeted assessments, enhanced program oversight, coaching and mentoring, and monthly monitoring of performance metrics throughout CHPRC. A formal effectiveness review will occur approximately six months beyond initiation of Phase II, currently scheduled for August 2011.

To support ongoing safe performance of work, functional program support personnel will provide focused oversight and mentoring at the projects through Phase I as well as Phase II implementation. CHPRC has also initiated a company-wide program for mentoring the conduct of work. Experienced personnel with duties specifically focused on mentoring and coaching work performance in the field have been assigned to each of the projects. This organization reports to the CHPRC Chief Operating Officer to assure consistency across CHPRC and to ensure a focus on mentoring.

Board Staff Specific Observations CHPRC Actions Define the Scope of Work-Define the Scope of Work-The institutional directive that governs work planning-PRCPRO-WKM-CHPRC utilizes PRC-PRO-WKM-079, Job Hazard Analysis, and PRC-PRO-12115, Work Management-sets forth the expectation that a team planning WKM-12115, *Work Management*, in tandem to perform hazard analysis and work process including job site walkdowns is used for planning work. Based on planning and control. Work package development uses a planning team approach discussions and interviews with CHPRC personnel conducted by the staff and includes (a graded approach) job site walkdowns. As indicated by the during this review, it appears that a team planning process is utilized and observation, CHPRC executes an active walkdown process with broad that craft workers actively participate in these walkdowns. However, participation by workers, supervisors, and Subject Matter Experts (SME). The CHPRC does not have a formal process documenting or retaining the process of hazard identification and control is extensive and involves multiple feedback obtained during these walkdowns, and therefore, the rigor and disciplines and work perspectives. This approach incorporates input from the effectiveness of these walkdowns cannot readily be assessed. In addition, walkdown(s), SME, and hazard analysis processes to develop work instructions. based on the work packages reviewed by the staff, it is not evident how the results of the walkdowns feed into the work planning process or how The CHPRC improvement initiative is revising PRC-PRO-WKM-079 and PRC-PRO-WKM-12115 to provide an improved set of instructions to plan and execute CHPRC ensures that comments are appropriately dispositioned or work; input from internal CHPRC reviews and identified deficiencies as well considered in the hazard analysis process. The staff notes that job site walkdowns are a key aspect of the hazard analysis process and that the from Department of Energy and Defense Nuclear Facilities Safety Board staff failure to document the outcomes of these walkdowns represents a missed was used. opportunity. The benefit provided by documenting and retaining the results of these walkdowns is particularly evident in the case of complex jobs, for Improvement Area 1: which planning occurs over a period of weeks or months during which CHPRC has strengthened requirements in the revised work planning process to: disruptions can occur to the continuity of the work planning teams. 1) generate documentation from walkdowns 2) use that documentation in work package preparation. These enhanced requirements will reside in PRC-PRO-WKM-079 when the revised program is fully implemented. PRC-PRO-WKM-12115 is being revised to specifically require the planning team to collect walkdown attendees' names, notes, and comments and retain them in a work package development file.

Board Staff Specific Observations	CHPRC Actions
Analyze the Hazards, and Develop and Implement Controls-	Analyze the Hazards, and Develop and Implement Controls
<i>CHPRC</i> accomplishes its activity-level hazard analysis primarily using a computer-based automated job hazard analysis (AJHA) tool. This is the most detailed activity-level hazard analysis process used by CHPRC. The AJHA tool is used both to perform the hazard analysis and to provide documentation of the results. The AJHA is normally completed during a tabletop session with a team comprising work planners, subject matter experts (SMEs), the field work supervisor, and craft workers. Typically, the resulting AJHA is then used by work planners to aid in the preparation of	Use of the Automated Job Hazard Analysis (AJHA) tool is described by PRC- PRO-WKM-079. The process of hazard identification and control development involves a multidisciplinary team. Workers, supervisors, SME, and work planning personnel collaborate in identifying hazards and developing/selecting controls (e.g. using their knowledge, experience, records) and the using the AJHA tool. AJHA tool development has emphasized the comprehensive evaluation of hazards.
the work instruction and is included as part of the work package for use by the field work supervisor.	Improvement Areas 2 and 3: Subject Matter Expert input into the hazard and hazard control identification
The staff noted several deficiencies in the AJHAs reviewed, including hazard analyses that focused almost exclusively on general work area	Incorporating hazard controls into work instructions
hazards, lacked a task-specific focus at the appropriate level, and included overly generic or nongermane hazards and controls. Furthermore the general hazards and associated controls listed in the AJHAs could not readily be linked to the specific tasks or activities to be performed. Department of Energy (DOE) Guide 440.1-8, <i>Implementation Guide for Use with 10 CFR</i> <i>Part</i> 851 <i>Worker Safety and Health Program</i> , specifies that two of the principal elements of an activity-level hazard analysis include the breakdown of operations and procedures into their component tasks, and the identification of hazards associated with each task and the controls necessary to protect workers against those hazards.	PRC-PRO-WKM-079 and PRCPRO-WKM-12115 are undergoing revision to provide an improved set of instructions to plan and execute work. As part of the revision of the CHPRC work management process, the expectations for AJHA development and utilization have been enhanced. SMS are being integrated more fully into the planning process and are being refocused on their responsibilities and roles in the work planning process through training, procedure reinforcement, and continuing mentoring. As a result, SME responsibilities are clearly defined to integrate task-specific controls into the work instructions during work planning as described below.
	Additionally, hazard controls in the AJHA have been electronically reformatted to highlight task-specific hazards and their controls. This reformatting separates more 'generic' hazards and controls from those identified specifically for the intended tasks; in so doing it enhances the task-specific controls for inclusion.
Collectively, the weaknesses of the AJHAs reviewed led the staff to question the usefulness of the tool and the rigor and thoroughness of the hazard analysis process. The staff notes that adequate performance of the hazard analysis is a prerequisite to effectively documenting and implementing hazard controls in the work instruction.	CHPRC is also promulgating more stringent expectations for hazard control inclusion in work instructions. The enhanced requirement drives more task- specific hazard controls to be placed directly with the applicable step(s) in the work instructions; this will provide better linkage between the AJHA and the work package and more emphasis on those task-specific hazard controls. This enhancement will also improve some administrative difficulties currently

Board Staff Specific Observations	CHPRC Actions
As an example, the staff reviewed one work package for removal of legacy	experienced by consolidating task-specific hazard instructions into a single place
piping from a glovebox. While the AJHA in the work package included a task breakdown, no associated hazards were identified or controls specified	in the work package instructions.
for the associated task steps. Residual liquid was expected during the	The reformatting of the AJHA and increased emphasis on task-specific hazard
performance of this activity, and the AJHA generically listed as a hazard "chemicals, wastes, or hazardous materials in the system," providing no	control inclusion in work instructions will improve performance in this area.
specific information. In lieu of such information, the AJHA directed the	These enhanced expectations and their implementation will, following final
reader to a document not contained within the work package for	CHPRC wide process implementation, provide better integration of hazard
information regarding the specific hazardous chemicals. As a result of this	identification and controls for more complex work packages. They also improve
lack of specificity, neither nitric acid nor plutonium, two of the hazards of	the visibility of task-specific hazards and their associated controls.
concern, was specified or discussed within either the AJHA or the work	
instruction. These hazards would likely have been identified during a task-	It is expected that as SME's are more proficient at integrating task-specific
specific hazard analysis.	controls into work instructions, improvements in configuration control and
	control alignment will be observed throughout the work performance. The
The staff reviewed one work package for excavation activities at the Waste	updated SME responsibilities and related briefings on expectations also involves
Retrieval Project (WRP). The AJHA had been issued prior to and was not	additional focus on the alignment of the task-specific controls from the hazard
subsequently revised following approval of the WRP retrieval plan and	analysis to implementation into the related work instructions which differs from
revision of the IH sampling plan. As a result, the controls specified in these	the historical review that primarily focused on the content of the hazard analysis.
documents were inconsistent. For example, the list of chemicals with	
specific threshold or action levels was inconsistent between the IH sampling	
plan and the AJHA. The AJHA did not specify monitoring for vinyl chloride even though it was listed on the IH sampling plan; conversely, the	
AJHA specified monitoring for hydrazine, which was not specified in the	
IH sampling plan. The AJHA specified the use of ground-penetrating radar	
(GPR) to characterize the excavation area in the trench, while the WRP	
retrieval plan stated that GPR was not required, and the technical procedure	
used to perform work was altogether silent with regard to the use of GPR.	
These examples illustrate the need to develop a single document that can be	
used to ensure that hazards are identified; that controls are appropriately	
developed; that the controls specified in the various documents within the	
work package are consistent; and that if controls are changed in one	
document, that change is accurately reflected throughout the work package.	

Board Staff Specific Observations	CHPRC Actions
In addition to the lack of task-specific hazard analysis, the AJHAs reviewed contained information that was both extraneous and nongermane. For example, one AJHA reviewed by the staff included general statements such as "Not wearing proper PPE [personal protective equipment] during work activities could pose a hazard to personnel" and a generic requirement to "communicate other hazards and control measures prior to commencing work." The inclusion of such overly generic statements is of questionable value and serves to dilute the effectiveness of the hazard analysis.	 Specific enhancements include more emphasis and definition of using the Critical Step process, and use of notes, warnings, and caution statements immediately preceding the steps to which they apply where potential hazards exist to implement task-specific controls. To minimize generic and extraneous hazard analysis and associated controls, the updated AJHA tool specifically identifies those "skill-based" controls that are not required to be incorporated into the work instructions. This supports additional focus on the analysis and development of controls to address task-specific hazards.
The staff observed that no mechanism is in place and no single document is developed during CHPRC's work planning process to ensure that the hazards identified and the controls required to complete a work activity safely are appropriately documented, deconflicted, and implemented. As a result, the hazards and controls identified in the AJHA and other documents included in the work package, such as Radiological Work Permits or Industrial Hygiene (IH) sampling plans, are not consistently specified.	CHPRC's team approach to identifying hazards, development of the controls and incorporating task specific controls in the work instructions will ensure at the task level the controls are deconflicted. This conforms to the guidance found in Department of Energy (DOE) Guide 440.1-8, <i>Implementation Guide for Use</i> <i>with 10 CFR Part</i> 851 <i>Worker Safety and Health Program</i> and the <i>Attributes of</i> <i>a Successful Work Planning and Control Process</i> provided to CHPRC by the DNFSB.
	Improvement Area 4:
	Designating a Responsible Manager to be responsible for work from beginning to end.
	The Responsible Manager should help integrate the hazard identification and control process as well.
Perform the Work-	Perform the Work-
CHPRC's process and requirements for pre-job briefings are described in PRC-PRO-WKM-14047, <i>Pre-Job Briefings and Post-Job Reviews</i> , and supplemented by project-specific pre-job briefing forms. The current pre-job briefing process requires the field work supervisor (FWS) to discuss the specific hazards and their associated controls. The work package for a	CHPRC utilizes PRC-PRO-WKM-14047, <i>Pre-Job Briefings and Post-Job Reviews</i> , as well as project-generated supplemental forms to conduct pre-job briefings and to capture feedback on work performed.
particular job should provide the information for this pre-job briefing.	The indicated issues are tied to the work packages developed using PRC-PRO-WKM-079 and PRC-PRO-WKM-12115.

Board Staff Specific Observations	CHPRC Actions
However, the work packages reviewed by the staff did not provide the required level of detail regarding the task-specific hazards and their associated controls required to support the FWS's pre-job briefing. The staff believes that hazards and their associated controls need to be integrated into the work instruction. It is unrealistic to expect the FWS to review and discuss these key elements during the pre-job briefing from memory, without their inclusion in the work package.	 Improvement Areas 4 and 5: Designating a Responsible Manager to be responsible for work from beginning to end. Developing new work instruction templates to provide consistency of application and minimize errors.
During the review, CHPRC management communicated their expectation that the FWS is responsible for verifying that the assigned workers are appropriately qualified and have received the required training. The work packages reviewed by the staff included specific training requirements solely in the AJHAs. This information is currently scattered throughout the AJHA and as such is not readily located. One 14-page-long AJHA reviewed by the	These improvements will address the issues of level of detail and layout in hazard controls and work instructions.<i>Improvement Area 7:</i>Identifying and conducting training on the enhanced process to work planners, responsible managers, and other personnel conducting work
staff contained, dispersed throughout, nine separate required training courses. The current process requires the FWS to determine what activities will be performed, search through the AJHA to identify the required training, and then confirm that the assigned individuals are qualified. The staff notes that the current format of the AJHA places an unnecessary burden on the FWS to sort through a lengthy AJHA and to identify the required training.	Training validation for work will be addressed during the training for the enhanced process. Use of the AJHA tool that consolidates the training requirements into a single report will be used as a basis to check the outputs of the Hanford Site Worker Eligibility Tool, the Worker Authorization Matrix and other sources to validate worker training. Planned improvements to PRC-PRO-WKM- 14047 will prompt the use of these tools and provide a roadmap for the FWS to
CHPRC has recently begun using the Hanford Site Worker Eligibility Tool, a computer-based tool that provides a list of eligible workers based on craft type, required medical qualifications, and specific training courses. However, this tool does not appear to be efficiently coordinated with the training requirements specified in the AJHA. The staff believes that integration of the training requirements specified by the AJHA with this eligibility tool would aid the FWS in determining that the assigned workers are appropriately	use in validating the requirements. The improvements undertaken to address the organization and formatting of the AJHA (coordinated with the changes to PRC-PRO-WKM-079) will help consolidate related items together and focus attention on the task-specific hazards and controls.
and the FWS in determining that the assigned workers are appropriately qualified and trained.Based on the above observations, the staff believes that CHPRC's work planning process is overly dependent on the FWS and the pre-job briefing process to remedy these weaknesses on the spot. It is unrealistic to expect the FWS to cover items during the pre-job briefing that are not readily supported by the AJHA or the work package.	These enhancements also will ensure that the critical task-specific instructions will be in the work instructions, simplifying the Field Work Supervisor's tasks in both the pre-job briefing and actual work performance.CHPRC has also initiated a program for mentoring the conduct of work.Experienced personnel with duties specifically focused on mentoring and coaching work performance in the field have been assigned to each of the projects. This organization reports to the CHPRC Chief Operating Officer to

assure consistency across CHPRC and to ensure a focus on mentoring.

Board Staff Specific Observations CHPRC Actions Feedback and Continuous Improvement-Feedback and Continuous Improvement-*Improvement Area 6:* Several external and internal reviews have identified this Integrated Safety Management (ISM) function as an area requiring improvement at CHPRC. The current feedback process is tied to PRC-PRO-WKM-079, PRC-PRO-WKM-The staff notes that feedback and improvement is recognized as a weak area 12115, and PRC-PRO-WKM-14047 is cumbersome but usable. Previous reviews of work planning and control across the DOE complex. CHPRC and other have identified that there are multiple paths to identify and process feedback; contractors in the DOE complex can benefit from participation in the ISM although utilized, these processes have been found to be confusing. and Quality Assurance subgroup of the Energy Facility Contractors Group Improvements in the feedback process to simplify the process and create uniform as it attempts to tackle this difficult problem. information flow have been initiated; those efforts will tie work feedback more closely into the CHPRC corrective action process. CHPRC has also instituted a mentoring process within its projects to provide realtime and near real-time feedback. Experienced personnel with duties specifically focused on mentoring and coaching work performance in the field have been assigned to each of the projects. This organization reports to the CHPRC Chief Operating Officer to assure consistency across CHPRC and to ensure a focus on mentoring. This effort coupled with targeted program assessments and coaching will provide real time feedback into the corrective action management system for work control program improvements. CHPRC is also improving its corrective action process as the result of other internal evaluations and DOE issues. Corrective action management is one of the four programmatic improvement areas identified in the CHPRC Integrated Performance Improvement plan. More resources and attention are being focused on operating the system to better achieve CHPRC's goals. CHPRC's Director of Improvement and Issues Management is Vice-Chair of the Energy Facility Contractors' Group (EFCOG) Feedback and Improvement Subgroup; CHPRC's Director of Operation Programs is a member of the EFCOG Work Management Subgroup. This continued participation in the EFCOG Subgroups will enable CHPRC's personnel to share in the best practices and innovative ideas developed and shared across the complex as part of our continuous improvement plan initiatives.