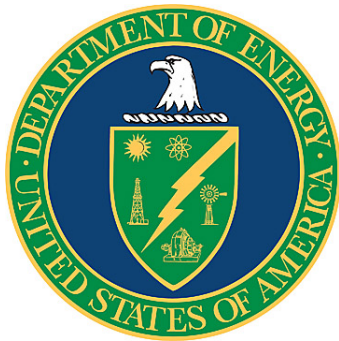




Waste Treatment Completion Company, LLC/Waste Treatment Plant Construction Project

Report from the Department of Energy
Voluntary Protection Program
Onsite Review
February 12-21, 2019



U.S. Department of Energy
Office of Environment, Health, Safety and Security
Office of Health and Safety
Office of Worker Safety and Health Assistance
Washington, DC 20585

**Department of Energy Voluntary Protection Program
Transitional Star Review
of
Waste Treatment Completion Company, LLC
Waste Treatment Plant Construction Project
Hanford Site, Washington
February 12-21, 2019**

The Department of Energy's (DOE) Voluntary Protection Program (VPP) Assessment Team (Team) from the Office of Environment, Health, Safety and Security (AU) determined the Waste Treatment Completion Company, LLC (WTCC) has successfully completed the 2-year transition process, which began in March 2017, and should be admitted to DOE-VPP as a Star participant. WTCC has stabilized its management structure, institutionalized its management expectations, and regained the trust and respect of the workforce.

Background:

Construction of the Waste Treatment Plant Construction Project (WTP) started in 2001, and DOE currently expects to begin vitrification of low-activity radioactive waste by 2022. Bechtel National, Inc. (BNI) is the prime contractor responsible for construction with AECOM as a designated subcontractor. In 2017, BNI and AECOM formed WTCC and then subcontracted WTCC to complete construction, startup, and commissioning of WTP.

BNI project activities include developing construction strategies; identifying hazards within all work activities; performing constructability reviews; developing construction schedules; managing material receipt; installing and maintaining permanent plant equipment; and executing complex civil, electrical, and mechanical construction activities.

The WTP project includes nonmanual employees from BNI and AECOM, building trade members, and subcontractors. The construction site is on 65 acres of previously undeveloped land on the Hanford site.

The WTP will eventually consist of three processing facilities: Pretreatment, Low-Activity Waste (LAW) Vitrification, High-Level Waste (HLW) Vitrification, as well as a large Analytical Laboratory, and the Balance of Facilities consisting of 20 support facilities. These facilities will immobilize more than 56 million gallons of radioactive and chemical wastes stored in 177 aging and leaking underground tanks. The plant will use vitrification technology, which blends the waste with glass-forming materials, heats it to 2,100 degrees Fahrenheit, then pours it into stainless steel canisters to cool and solidify. In this glass form, the waste is stable, impervious to the environment, and its radioactivity will safely decay over hundreds to thousands of years. In 2016, DOE decided to pursue a strategy that bypasses the pretreatment facility to direct-feed low-activity waste (DFLAW), and delay completion of the HLW facility.

When BNI turned the construction site over to WTCC in March 2017, it also transferred the DOE-VPP Star. Normally, the transition of a DOE-VPP Star to a new contractor would allow a 2-year transition period while the new contractor establishes itself at the site. Since BNI transferred a conditional Star, AU, DOE's Office of River Protection, BNI, and WTCC all agreed that AU would perform the conditional review in 12 months from the date of the 2016 review rather than waiting 2 years. Accordingly, in February 2018 the Team reviewed the status

of actions addressing the conditions and gauged the effectiveness of those actions in stimulating and encouraging Employee Involvement. That assessment determined WTCC had addressed the conditions, but needed additional time to stabilize its management structure, institutionalize its expectations, and regain the trust and respect of the workforce. Consequently, the Team returned to the site in February 2019 to complete the transitional assessment.

Results:

Since February 2018, WTCC managers have concentrated their efforts to engage the workforce. These engagements are occurring at all levels of management. It began emphasizing Management Team Engagements for senior managers where senior managers walk around the site and interact with workers. WTCC established a goal of 50 Management Team Engagements per month. It tracks completed walkarounds and reports the number of walkarounds in the safety and health data presented to the Executive Safety Review Board (ESRB). At the February 2019 ESRB meeting, the data showed WTCC achieved the goal in January, but had not yet achieved it in February. Only a few senior managers performed a majority of those observations. Although not documented, feedback from the workforce demonstrated that they see senior managers in the workspaces, and WTCC’s safety culture surveys and self-assessments show many workers feel more engaged.

In October 2018, WTCC initiated its Workforce Observation and Engagement Program for middle managers. Under this program, middle managers perform workforce observations on a published schedule that covers every hour of every day. The assigned manager picks the location, and spends about 1 hour walking around, talking to workers, and observing work and conditions. He or she then describes what they observed, how they engaged with the workers, and any observations or feedback they received. A single manager, currently the general superintendent for the LAW, collects the information. The current manager does not have sufficient authority to ensure assigned managers complete the assigned observation, or sufficient resources to review the completed observations. Consequently, only a small percentage of assigned observations are completed, and review of collected data for trends, lesson learned, or other actionable information is sporadic. Documented observations have a wealth of useful information that can benefit WTCC. WTCC should reassign this review function into the plant management organization, perhaps into the Safety Culture Improvement Team (SCIT). The SCIT currently integrates efforts between the various safety improvement committees and can help integrate the management observation and engagement results into safety campaigns and improvement efforts.

<p>Opportunity for Improvement: WTCC should reassign this Workforce Observation and Engagement Program review function into the plant manager organization, perhaps into the SCIT, to help integrate the results into safety campaigns and improvement efforts.</p>
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The Team heard from workers that the current management team, particularly the general manager, demonstrates a “find it, fix it, move on” mentality. The managers welcome comments from workers regarding problems and potential solutions, and WTCC is committed to solving problems.

The management team recognizes that the project has a challenging schedule, and the remaining work is extremely complex. WTCC has established what it believes are realistic schedule milestones, with challenging but achievable dates, and that schedule determines priorities and resource assignments. Managers are trying to shield workers from obvious schedule pressures; encourage workers to do it right, not take shortcuts, and not create problems that lead to delays and rework; and firmly believe this approach will allow them to succeed.

In some cases, the complexity of the schedule and the shifting resources and assignments are creating frustration for workers. The bulk of the craft workers have never participated in completion, startup, and commissioning of a nuclear facility. They are unaccustomed to the frequent changes in task assignments required by the process. The project schedule contains multiple parallel tasks that are interdependent. WTCC may be able to help workers understand these priority shifts by more communication that explains the interdependencies. Supervisors should ensure that they inform workers of all the possible tasks during the daily work briefs, including priorities and contingencies, to help workers understand task changes during the day.

Opportunity for Improvement: Supervisors should ensure that they inform workers of all the possible tasks during the daily work briefs, including priorities and contingencies, to help workers understand task changes during the day

When BNI and AECOM formed WTCC, it structured the organization with a senior management team of seconded people from the parent corporations. The initial general manager was trying to emphasize a “one-team” atmosphere. In December 2017, BNI assigned a new general manager and AECOM appointed a new deputy general manager. Both of these individuals have extensive experience managing complex hazardous facilities.

In 2018, the nuclear facility/site manager left to go to another project, and WTCC split that position into two: the nuclear facility manager and the site manager. AECOM also replaced the plant manager with another individual with extensive experience managing the Hanford tank wastes.

Although the senior management team is committed to the completion of the project and seeing the LAW plant operate, they generally continue to identify more with their parent corporation (BNI or AECOM) than they do with WTCC. This results in some perceived conflict within the organization when the parent corporations’ policies and cultures do not align. These corporate differences are particularly evident in the worker safety and health approach. Both parent companies are committed to worker safety as a prerequisite for project success, but their approaches are different. The management team members each have their own experience with the corporate safety programs resulting in different leadership approaches.

For example, BNI emphasizes ten *life critical* tasks and requires each of its subcontractors to include its *Life Critical Program* in its safety and health plan. BNI believes that compliance with those *life critical* requirements is essential, and violation of any of them may be grounds for immediate removal from the project. AECOM centers its corporate safety program on *9 Life*

Preserving Principles that includes a more proactive approach to employee involvement, management leadership, and reward and recognition.

The difference between these approaches sometimes leads to managers believing that their counterparts are “too eager to punish” or “not willing to hold people accountable.” These corporate differences also contribute to perceptions among the construction craft workers (referred to as “manuals”) and their supervisors (mostly BNI) that nonmanuals (who in large part come from AECOM) are held to a lower standard. As a means of solidifying the WTCC team, WTCC should revive its “one-team” efforts, and managers should refrain from referring to themselves as either BNI or AECOM employees. Further, WTCC should examine both the BNI and AECOM corporate safety approaches and integrate the best aspects of both programs to create a corporate WTCC safety philosophy.

Opportunity for Improvement: WTCC should revive its “one-team” efforts, and managers should refrain from referring to themselves as either BNI or AECOM employees.

Opportunity for Improvement: WTCC should examine both the BNI and AECOM corporate safety approaches and integrate the best aspects of both programs to create a corporate WTCC safety philosophy.

Over the past 2 years, WTCC has relied on its VPP Action Team (VAT) and SCIT to champion its VPP efforts. In early 2018, WTCC reassigned the SCIT members from the Safety and Health organization to the Plant Management organization under the site manager. This move helped integrate the safety culture improvement efforts with the plant management and operation approach and created more independence and flexibility for the SCIT.

The nuclear facility/site manager requested specific budget resources for SCIT in the fiscal year 2019 budget, but BNI denied that request. Although there is not a discrete budget item, current managers have committed necessary resources to maintain the SCIT efforts. The SCIT does have a budget for rewards and recognition, but does not have additional committed resources for other safety culture improvements. The SCIT believes itself to be a well-functioning team and believes its current location in the organization gives it the visibility and independence it needs to succeed. SCIT members are concerned that without committed budget resources, it is at risk of being placed back in the Safety and Health organization and will be slowly disassembled. WTCC should ensure: (1) its corporate commitment to improved safety culture is backed up with resource commitments; and (2) the personnel leading those improvement efforts are optimally located within the organization to achieve the desired results.

Opportunity for Improvement: WTCC should ensure: (1) its corporate commitment to improved safety culture is backed up with resource commitments; and (2) the personnel leading those improvement efforts are optimally located within the organization to achieve the desired results.

During this assessment, the Team saw improvement in Employee Involvement. WTCC has revitalized its safety committees, and more craft workers are volunteering to participate on those committees. Area Safety Teams (AST) are more active, performing site-safety inspections, addressing safety concerns, and leading safety campaigns. The Team saw notable improvement within the ranks of the craft workers. Although several craft workers stated negative opinions about WTCC's ability to manage and complete the project; when asked about safety, even these naysayers were confident in their ability to raise safety issues. They expressed less confidence that WTCC would address those issues in a timely manner, but could not provide specific examples of safety issues that WTCC had not addressed. Further, they did not express any fear of retribution or retaliation for raising safety issues. All workers contacted by the Team understood they had multiple channels to raise safety issues, beginning with their immediate foreman, general foreman, union steward, craft safety representatives, VAT members, other managers, submitting issues through the Safety Observation for Awareness and Risk – Reduction (SOAR) program, or the DOE Employee Concerns Program. Employees understood their stop-work rights and responsibilities, and would not hesitate to pause or stop work if they did not understand a procedure or felt there was a safety issue that needed to be resolved.

Unlike 2 years ago, craft workers now believe their supervisors support participation on safety committees. WTCC ensures craft workers are given time to participate in meetings and team activities. Craft workers also receive 50 points on their craft performance reviews as a bonus for participating on a safety team.

WTCC recently began 24/7 shift operations. It currently has four rotating shifts. These shifts work 4 days on, 4 days off, and switch between day and night shift. This schedule restricts shift workers' access to AST meetings or other committee meetings that typically occur during the day. WTCC is aware of the issue and is currently considering approaches that ensure shift workers have the same access to safety committees.

WTCC continues supporting the Craft Safety Watch (CSW), a behavior-based safety initiative originating from BNI. CSW is a behavior-based safety program that identifies and interrupts unsafe or at-risk behaviors. Workers volunteer to become members of the CSW, and WTCC and the union then screen them for suitability. Members receive training on how to conduct observations and how to discuss results with observed workers. WTCC, through the CSW committee, expects members to perform at least four observations per week and support the committee by identifying and addressing other safety issues.

CSW members are committed to improving safety, but CSW has not been effective in altering the workforce safety culture. Effective behavior-based safety programs encourage conversations between peers and encourage workers to spend time observing their coworkers' behaviors, identifying and correcting at risk behaviors. WTCC's CSW is missing this element, because only a few workers perform observations. As of January 2018, more workers allowed CSW to observe them because WTCC gave them token rewards for participating. Since 2018, the program has not achieved the desired results because although workers agree to the observation, they do not consistently listen to CSW observers' feedback. The Team observed cases within the project where workers who exhibited at-risk behaviors stopped the behavior, only to resume it

when the Team was out of sight. This was confirmed when the Team saw the same workers and the same behaviors a short time after the initial encounter. WTCC should work with the CSW to revise its approach to encourage all craft workers to perform safety observations, collect the observations, and help WTCC evaluate the collective data.

Opportunity for Improvement: WTCC should work with the CSW to revise its approach to encourage all craft workers to perform safety observations, collect the observations, and help WTCC evaluate the collective data.

Since December 2018, WTCC has implemented a new work control procedure for maintenance and operations. This process implements work control for all work performed by the maintenance organization. The system incorporates the DOE Activity-Level Work Planning and Control guide and implements integrated safety management at the activity level. The process uses a new activity job hazard analysis (JHA) rather than the previous construction JHA and incorporates the identified controls from the JHA into operating and maintenance procedures. The maintenance organization has seen the largest change from this new procedure. Workers have been told that all maintenance work should now be planned using the new process, but some former maintenance procedures remain in effect. Consequently, some workers have raised questions when given an old maintenance procedure. To their credit, they are stopping work and asking the question. The Plant Engineering and Maintenance organization is continuing to address the issue.

WTCC continues to use the Safety Task Analysis Risk Reduction Talk (STARRT) cards as a pre-work safety checklist and coordination tool. Supervisors use STARRT cards during pre-shift meetings to guide safety discussions, stimulate workers' questions and suggestions, answer questions, and provide feedback. Workers contribute to the completion of the cards and participate by identifying hazards, establishing controls, and helping plan the work. The cards include likely error precursors, actions necessary to avoid errors, and other activities in the area that might affect the work. They also include specific information about potential hazards, such as lifts, chemical usage, hot work, excavation, body hazards, ergonomic hazards, and weather. Safety personnel review STARRT cards daily and document the review by signing the card.

The Team observed many instances where supervisors interacted with workers before work commenced and discussed hazards and the correct corresponding controls using STARRT cards. Employees universally described their involvement in the daily crew/STARRT card meetings and expressed that these meetings provided an avenue for crew discussions on safety. They felt their voices were heard and that they were responsible for their own safety and the safety of their coworkers.

WTCC continues to use SOAR as the primary means to track safety issues. SOAR stations are located around the site, and anyone may complete a SOAR card and place it in the locked box. ASTs collect the SOAR cards in their areas weekly and then review the issues. ASTs elevate issues beyond their authority to the Zero Accident Council (ZAC), Safety and Health, or the appropriate managers. Binders at the SOAR stations list issues and the status of corrective actions for that area to keep craft workers who do not have computer access apprised of actions taken regarding employee concerns and suggestions. While it does not provide real-time

updates, employees who submit safety concerns in this manner can follow their status through resolution. Managers also strive to maintain the feedback loop by personally notifying employees regarding actions taken on the issues they submit on SOAR cards.

The ZAC identified that some SOAR cards are not always collected weekly, leading to concerns that employee-raised issues may not be addressed in a timely manner. To address this concern, the ZAC co-chair volunteered to revise the process. The ZAC co-chair plans to personally collect all the SOAR forms onsite, then review the forms and send them to the responsible AST, Safety and Health, or appropriate manager for resolution.

WTCC faces some challenges implementing the hierarchy of controls, primarily in preventing *life critical* violations related to scaffold and excavation access. Current controls for these access points rely only on administrative controls (an inspection each shift and signed access tag). While the use of inspections and signed tags is a general construction industry practice, the WTCC policy on *life critical* tasks discourages workers from reporting errors. Administrative controls are the weakest controls in the hierarchy and are predictably error prone. WTCC wants workers to report errors and help create error resistant policies and procedures. However, when errors occur, the violators receive either a suspension (for human error) and a warning to do better or termination (for willful violation), thus discouraging error reporting. WTCC has not considered or sought engineered or redundant barriers to help interrupt the human error potential related to a single administrative control. This weak control is inconsistent with the declared importance of the control.

To its credit, last year WTCC and the Building Trades Council (BTC) reached agreement on a progressive disciplinary approach to *life critical* violations. WTCC can now use its discretion if a worker makes an honest error and self-reports the violation. Instead of termination, Craft workers can receive a 7-day suspension. WTCC (and BNI prior) has used that approach for nonmanuals for several years. The disparity created a perception among the craft workers that WTCC had a double standard, and treated manuals more harshly.

Although the revised bargaining agreement has been in place for several months, many craft workers were unaware of the change, and expressed a reluctance to self-report any violation because of the perceived risk of termination. WTCC should engage leaders (stewards, craft safety representatives, general foremen) in the BTC to help it spread the word about the revised bargaining agreement and the progressive approach to discipline.

<p>Opportunity for Improvement: WTCC should engage leaders (stewards, craft safety representatives, general foremen) in the BTC to help it spread the word about the revised bargaining agreement and the progressive approach to discipline.</p>
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WTCC faces another perception problem regarding *life critical* requirements. Corporately, it believes those *life critical* requirements are essential to protect human life and health on the job site. However, craftworks often refer to them as “ten ways to get fired.” This consistent reference among the craft workers indicates that WTCC has not successfully communicated its reasoning behind its policy for identifying *life critical* tasks. At least one new worker described

the new hire presentation on *life critical* tasks as a warning or threat rather than as the intended message, ‘these are the top ten ways workers are seriously hurt or killed in the construction industry.’

WTCC should look for ways to better communicate its reasoning behind *life critical* requirements and improve worker perceptions regarding enforcement of those requirements. For example, WTCC managers could help quell rumors regarding termination for *life critical* violations by communicating facts while protecting workers’ privacy. WTCC should also review its *life critical* training, evaluate the presentation style, and ensure instructors present *life critical* items as a serious concern for the employees’ safety and well-being. The training could include specific examples of how self-reporting of errors related to *life critical* requirements led to consideration and leniency rather than termination.

Opportunity for Improvement: WTCC should review its *life critical* training, evaluate the presentation style, and ensure instructors present life critical items as a serious concern for the employees’ safety and well-being.

ASTs have had successes addressing specific safety concerns and implementing targeted safety campaigns. In one case, an AST conducted a worksite ergonomics campaign that identified 18 items of concern. The team addressed the top five items. In another example, the team observed workers dumping mop buckets by lifting them by hand over a trailer handrail. Because of the AST’s observation, WTCC installed catch basins for dumping mop buckets to eliminate the ergonomic stress. WTCC also provided dump containers at water bottle stations so workers could dump any remaining water before disposing of the bottle. This significantly reduced the weight of the trash containers and provided a safer and more efficient means of handling the waste.

Some workers expressed frustration towards supervisors regarding a perceived failure to account for collateral risk associated with scaffold construction. Scaffolds reduce the risk of falls during elevated work, but building a scaffold has inherent risks. WTCC does not compare the risk of a worker performing a simple task using a ladder and fall protection to the scaffold construction risks. Workers believe there are many occasions when the risk from the use of a ladder with fall protection is significantly less than the collective risk of a crew building a scaffold. Procedure 24590-WTP-GPP-SIND-004, Rev 13, *Scaffolding*, and associated forms did not identify provisions to compare those risks prior to approving a scaffold request. WTCC should consider revising the scaffold request process to include a comparative analysis of risk to the intended end user(s) versus the risk to a carpenter crew prior to approving the scaffold request.

Opportunity for Improvement: WTCC should consider revising the scaffold request process to include a comparative analysis of risk to the intended end user(s) versus the risk to a carpenter crew prior to approving the scaffold request.

As WTCC begins the transition to operations, it is moving personnel out of trailers into permanent spaces, and converting space in the trailers to training space at the construction site.

This is making it easier to bring new people onboard, consolidate training requirements, and make retraining more accessible.

Conclusions

Since its creation in March 2017 and transfer of the DOE-VPP Star from BNI, WTCC has improved the relationship between managers, supervisors, and workers. The improvements identified in the 2018 assessment have matured, and WTCC has stimulated additional Employee Involvement through several approaches. Increased manager presence at the worksite, increased opportunity for participation in employee safety committees and teams, and manager emphasis on respect between workers and supervisors remain evident. WTCC has stabilized its management structure, institutionalized its management expectations, and regained the trust and respect of the workforce. Although stable, the accident and injury rates are well below the heavy construction industry average. The Team expects that WTCC's continued efforts to build trust among the craft workers and demonstrate management and supervisory presence in the work areas will lead to a decline in those rates. WTCC has successfully completed the 2-year transition process, which began in March 2017, and should be admitted to DOE-VPP as a Star participant.

Injury Incidence/Lost Workdays Case Rate (WTCC)					
Calendar Year	Hours Worked	Total Recordable Cases (TRC)	TRC Incidence Rate per 200,000 hours	DART* Cases	DART* Case Rate per 200,000 hours
2016	2,208,751	12	1.08	7	0.6
2017	2,548,172	13	1.0	8	0.6
2018	3,678,530	13	0.7	10	0.5
3-Year Totals	8,435,453	38	0.9	25	0.6
Bureau of Labor Statistics (BLS-2017) average for NAICS** 237 (Heavy and Civil Engineering Construction)			2.5		1.5
Injury Incidence/Lost Workdays Case Rate Subcontractors (WTCC subcontractors)					
Calendar Year	Hours Worked	Total Recordable Cases (TRC)	TRC Incidence Rate per 200,000 hours	DART* Cases	DART* Case Rate per 200,000 hours
2016	241,794	4	3.31	2	1.6
2017	331,838	0	0.0	0	0.0
2018	378,678	1	0.5	1	0.5
3-Year Totals	952,310	5	1.05	3	0.6
Bureau of Labor Statistics (BLS-2017) average for NAICS** 237 (Heavy and Civil Engineering Construction)			2.5		1.5

* Days Away, Restricted, or Transferred

**North American Industry Classification System

TRC Incidence Rates, including subcontractors: 0.91

DART Rates, including subcontractors: 0.59

Discussion

The TRC and DART rates used in the February 2018 report represented BNI's performance and the first 9 months of the WTCC contract. The charts above represent BNI's performance for 2016 and WTCC's performance for 2017 and 2018. Because many of the employees have remained the same during the changeover from BNI to WTCC, the comparison and trending is valid.

In 2016, when recordable cases showed an increase, BNI implemented a structured system called the Incident Reporting and Information System (IRIS) to conduct risk ranking and evaluation of

the cases. BNI used that system to determine the causes of the injuries to assist with improvement activities and initiatives. The analysis indicated that personnel new to the WTP project during 2016 brought an outside safety culture with them and had to learn the safety expectations of the worksite. Additional analysis determined that the work included an increase in volume of routine work and construction activities across the WTP site.

BNI concluded that the incidents stemmed from the influx of new personnel at the site and an increase in work activities. IRIS allowed BNI to identify trends and programmatic improvements in order to learn from incidents. With this information, BNI used additional focused hazard analyses to eliminate or mitigate potential hazards and reduced injuries and illnesses in 2017 and 2018. WTCC's injury rates have remained relatively constant. When compared to similar work in the industry, WTCC's injury and illness rates are more than 50 percent lower and meet the expectations for VPP participation.