

U.S. Department of Energy
Office of River Protection

P.O. Box 450, MSIN H6-60
Richland, Washington 99352

APR 30 2007

07-WTP-083

Mr. C. M. Albert, Project Manager
Bechtel National, Inc.
2435 Stevens Center Place
Richland, Washington 99354

Dear Mr. Albert:

CONTRACT NO. DE-AC27-01RV14136 – TRANSMITTAL OF THE U.S. DEPARTMENT OF ENERGY, OFFICE OF RIVER PROTECTION (ORP) DESIGN OVERSIGHT REPORT: WASTE ENGINEERING DIVISION ASSESSMENT OF THE BECHTEL NATIONAL, INC. (BNI) METRIC PROGRAM FOR NUCLEAR SAFETY AND QUALITY CULTURE IMPERATIVE (D-07-DESIGN-038)

Reference: ORP letter from R. J. Schepens to W. S. Elkins, BNI, "Improving the Hanford Tank Waste Treatment and Immobilization Plant (WTP) Project Nuclear Safety Culture," 06-ESQ-092, dated on July 11, 2006.

ORP conducted an assessment of the BNI Metric Program for Nuclear Safety and Quality Culture Imperative from January 26 through February 9, 2007 and is transmitting the resulting attached report (Design Oversight Report D-07-DESIGN-038).

Report conclusions are as follows:

1. The existing Nuclear Safety and Quality Initiative (NSQI) Project had no defined program or plan for the implementation of nuclear safety and quality improvements (bullet 4 of the Reference). The need for the development and implementation of a defined program or plan, either through the NSQI Project or the Integrated Safety Management System (ISMS) process, will be followed by Assessment Follow-up Item (AFI) D-07-WED-038-A01.
2. NSQI Project metrics and oversight activities, by themselves, are not sufficient to monitor for nuclear safety and quality culture change, and in particular, for determining whether improvements are being made in addressing the eight WTP weaknesses agreed to by BNI and ORP and expressed in Corrective Action Request (CAR) CAR-QA-05-331. BNI needs to improve the quality and adequacy of the metric process and address the sufficiency of existing metrics in the NSQI process; or consider transferring the culture monitoring to the ISMS program, via the metrics of the performance objectives, measures, and commitments (POMCs). In addition to the metrics improvements, AFI D-07-DESIGN-038-A02 will track the closure of CAR-QA-05-331 and the transition to monitoring the long-term nuclear safety and quality culture shift via the ISMS fiscal year (FY) 2008 Annual Declaration and assigned POMCs.

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- 3. Confirmation that BNI actions to date have improved BNI's nuclear safety culture could not be determined from the NSQI metric data. The lack of evidence confirming either a positive or negative trend of the NSQI Project metrics, suggests that NSQI initiatives did not have sufficient time to effect discernable change in culture (which normally takes a few years). (Observation D-07-WED-038-003).

BNI is requested to inform ORP of the actions to be taken to address these issues and the dates for resolution within 30 days of receipt of this letter.

This letter is not considered to constitute a change to the Contract. In the event the Contractor disagrees with this interpretation, it must immediately notify the Contracting Officer orally, and otherwise comply with the requirements of the Contract clause entitled 52.243-7, "Notification of Changes."

If you have any questions, please contact me, or your staff may call Robert W. Griffith, Acting Director, WTP Project, Engineering Division, (509) 372-2821.

Sincerely,



John R. Eschenberg, Project Manager
Waste Treatment and Immobilization Plant Project

WTP:JEA

Attachment

- cc w/attach:
- W. S. Elkins, BNI
- D. Jantosik, BNI
- L. Lamm, BNI
- M. Lewis, BNI
- S. C. Lynch, BNI
- D. Pisarcik, BNI
- BNI Correspondence

U.S. Department of Energy, Office of River Protection


THE U.S. DEPARTMENT OF ENERGY (DOE), OFFICE OF RIVER PROTECTION (ORP) DESIGN OVERSIGHT REPORT

WASTE ENGINEERING DIVISION ASSESSMENT OF THE BECHTEL NATIONAL, INC. (BNI) METRIC PROGRAM FOR NUCLEAR SAFETY AND CULTURE IMPERATIVE

February 2007

Design Oversight: D-07-DESIGN-038

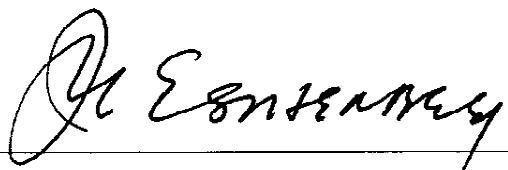
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Waste Treatment and Immobilization Plant

Assessment of the Bechtel National, Inc. Metric Program for Nuclear Safety and Culture Imperative (D-07-DESIGN-038)**EXECUTIVE SUMMARY**

The U.S. Department of Energy (DOE), Office of River Protection (ORP) staff conducted a Design Oversight of the Bechtel National, Inc. (BNI) Metric Program for the Nuclear Safety and Quality Imperative (NSQI) with the following objectives:

1. Evaluate whether BNI had a project plan for both short-term and long-term improvement of the Waste Treatment and Immobilization Plant (WTP) nuclear safety and quality culture.
2. Evaluate the adequacy of the present NSQI Project metrics being used to measure the effectiveness of NSQI initiatives.
3. Evaluate whether actions to-date had been effective in improving WTP's nuclear safety and quality culture.
4. Evaluate whether BNI's closure of the NSQI CAR-QA-05-331 (which tracks BNI actions for improvement of its nuclear safety and quality culture) would be sufficient to provide a measurable nuclear safety and quality culture shift through the existing NSQI Project.

Overall Conclusions:

The Assessment Team concluded the following:

- Qualitative and quantitative data were being collected, but there did not appear to be a method to collect and analyze data through a controlled project plan to draw conclusions about a shift in BNI's nuclear safety and quality culture. The existing NSQI Project had no plan in place dealing with the ORP expectation communicated in Reference 1 (Section 6.1). The need for the development and implementation of a defined program or plan, either through the NSQI Project or Integrated Safety Management System (ISMS) process, for the improvement of the nuclear safety and quality culture improvements will be followed by assessment follow-up item (AFI) D-07-WED-038-A01.
- NSQI Project metrics and oversight activities, by themselves, are not sufficient to monitor for nuclear safety and quality culture change, and in particular for determining whether improvements are being made in addressing the eight WTP weaknesses (CAR-QA-05-331). BNI needs to improve the quality and adequacy of the metric process and address the sufficiency of existing metrics in the NSQI process; or consider transferring the culture monitoring to the ISMS program via the metrics of the performance, objectives, measures, and commitments (POMC). In addition to the metrics improvements, AFI D-07-DESIGN-038-A02 will also track the closure of CAR-QA-05-331 and the transition of the long-term nuclear safety and quality culture shift monitoring via the ISMS fiscal year (FY) 2008 Annual Declaration and assigned POMCs.
- Actions to-date to improve BNI's nuclear safety and quality culture had not yet been effective as seen by the NSQI metric data. The lack of positive evidence confirming either a positive or negative trend in some of the NSQI Project metrics suggested NSQI initiatives had not had sufficient time to be implemented effectively for a change in culture (which normally takes a few years). (Observation D-07-WED-038-O03)

Assessment of the Bechtel National, Inc. Metric Program for Nuclear Safety and Culture Imperative (D-07-DESIGN-038)

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Appendix A. WTP Engineering Division Design Oversight Plan for the Review of BNI Metric
Program for Nuclear Safety and Culture Imperative

Assessment of the Bechtel National, Inc. Metric Program for Nuclear Safety and Culture Imperative (D-07-DESIGN-038)**LIST OF ACRONYMS**

| | |
|------|---|
| AFI | Assessment Follow-up Item |
| ATS | Action Tracking System |
| BNI | Bechtel National Inc. |
| CAR | Corrective Action Request |
| DOE | U.S. Department of Energy |
| DR | deviation report |
| FY | fiscal year |
| INPO | Institute of Nuclear Power Operations |
| ISMS | Integrated Safety Management System |
| NSQI | Nuclear Safety and Quality Imperative |
| NTS | Non-Conformance Tracking System |
| ORP | Office of River Protection |
| PIER | Project Issue Evaluation Report |
| POMC | performance objectives, measures, and commitments |
| QA | Quality Assurance |
| WTP | Waste Treatment and Immobilization Plant |

Assessment of the Bechtel National, Inc. Metric Program for Nuclear Safety and Culture Imperative (D-07-DESIGN-038)

1.0 INTRODUCTION

A major component of the U.S. Department of Energy (DOE), Office of River Protection (ORP) mission is the oversight of the Waste Treatment and Immobilization Plant (WTP) contractor's performance. The contractor for the WTP is Bechtel National, Inc. (BNI). As part of its oversight responsibilities, ORP performs various assessments of BNI activities during the design and construction phase. This design oversight assessment reviews the adequacy of the BNI metric program for the Nuclear Safety and Quality Imperative (NSQI), being implemented across the WTP. This assessment was scheduled in the fiscal year (FY) 2007 assessment schedule, which was created under the *ORP Integrated Assessment Program (ORP M 220.1)*, Rev. 4. The design oversight consisted of document reviews, as well as BNI management and staff interviews. The Assessment Team clarified and evaluated the initial information through early February 2007 and prepared the report in late February 2007. The preliminary report was informally reviewed by BNI for factual accuracy before issuing the final report.

2.0 BACKGROUND

The NSQI Project was formed based on deficiencies in BNI's nuclear safety and quality culture as documented in the *ORP Environmental Safety and Health (ES&H) Assessment (A-05-ESQ-RPPWTP-009)*, issued on December 08, 2005. The assessment concluded BNI was exhibiting weak nuclear safety and quality culture resulting from a lack of:

- Discipline in the strict adherence to procedures,
- Formal training to ensure individuals understand the processes used,
- Institutional use of ad hoc procedures, and
- A questioning attitude.

In response to the ES&H Assessment Report, BNI issued Corrective Action Request (CAR) QA-05-331, Rev. 0 on December 20, 2005, to document the issue and identify corrective actions. Between January 20 and March 24, 2006, BNI held management alignment sessions with ORP to gain consensus on the NSQI statement, associated values, and draft supporting behaviors. These sessions identified eight weaknesses, which are listed in item 331-2 of CAR QA-05-331:

1. Procedural compliance
2. Adequacy of procedures
3. Training of personnel to comply with procedures
4. Verification and approval of work activities
5. Balancing cost, schedule, and quality
6. Management oversight and assessment
7. Quality improvements including questioning attitude
8. Communications and feedback

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BNI subsequently established the NSQI Project and used outside consultants with significant expertise to assist in developing a nuclear safety and quality culture statement. In addition, BNI utilized its corporate “Six Sigma Black Belts” process to provide input to the CAR and develop the metrics set used to track performance and provide closure.

3.0 OBJECTIVES

ORP staff conducted the assessment of the NSQI with the following specific objectives:

- Evaluate whether BNI had a project plan for both short-term and long-term improvement of the WTP nuclear safety and quality culture.
- Evaluate the adequacy of the present NSQI Project metrics being used to measure the effectiveness of NSQI initiatives.
- Evaluate whether actions to-date had been effective in improving WTP’s nuclear safety and quality culture.
- Evaluate whether BNI’s closure of the NSQI CAR-QA-05-331 (tracks BNI actions for improvement of its nuclear safety and quality culture) would be sufficient to provide a measurable nuclear safety and quality culture shift through the existing NSQI Project.

4.0 RESULTS

4.1 PLAN FOR IMPLEMENTING AND MONITORING A CHANGE IN CULTURE

The Assessment Team reviewed available correspondence and documentation, and conducted interviews of the BNI staff, management, and the NSQI Project management team. The focus of this review was to determine if BNI had a controlled plan for implementing and monitoring improvements in its nuclear safety and quality culture. The Assessment Team reviewed all available project information, including the NSQI Project metrics used to monitor performance, and interviewed the NSQI Project management team interpreting these metrics, to determine whether desired improvements in nuclear safety and quality culture were being attained. In addition, the Assessment Team reviewed the ORP letter 06-ESQ-092 from R. Schepens to B. Elkins, “Improving the Hanford Tank WTP Project Nuclear safety and quality culture,” dated July 11, 2006, to determine commitments related to the need for a culture shift as discussed at a February 7, 2006, enforcement conference.

The Assessment Team review of ORP letter 06-ESQ-092 (Reference 1 in Section 6.1) determined BNI had committed to “projectize” the NSQI initiatives. The Assessment Team reviewers assumed (based on reading the letter) “projectize” implied a project plan, milestones, schedule, and performance metrics would be developed. In addition, the letter indicated BNI intended to take its nuclear safety and quality culture to a level seen at commercial nuclear power plants.

Although BNI had established a Work Breakdown Structure (WBS) with an associated schedule and some metrics for the NSQI Project, the Assessment Team could find no evidence of a BNI NSQI Project Plan integrating project activities and describing how NSQI metrics and other

Assessment of the Bechtel National, Inc. Metric Program for Nuclear Safety and Culture Imperative (D-07-DESIGN-038)

performance information would be interpreted to demonstrate improvements in nuclear safety culture. This was confirmed in interviews with the NSQI Project Manager. Additionally, it was unclear what actions BNI had taken to determine and define the level of nuclear safety and quality culture attained at commercial nuclear power plants and institute actions to attain this level of performance on the WTP.

In addressing the issue of no plan or method of measuring progress, BNI stated this issue was discussed in the February 5, 2007, NSQI Steering Committee Meeting. The discussion concerned how the project would monitor changes in nuclear safety and quality culture after the short-term actions associated with CAR-QA-05-331 were closed. The NSQI Project Manager presented a conceptual approach to the Assessment Team on how this monitoring might be done. The concept involved performing an annual assessment of the “state of the culture” with aggregate conclusions presented to the NSQI Steering Committee. Information and performance data would be derived from the Annual Employee Survey, project metrics, management assessments (in which aspects of culture within functional areas would be evaluated using consistent lines of inquiry), and quarterly reviews by the External Advisory Board.

Even though the NSQI Steering Committee might be a good oversight and advisory body, the Assessment Team concluded a project plan was necessary to ensure the short-term goal of closing CAR-QA-05-331 (established actions to correct latent institutional issues for initiating the culture shift) and the long-term goal of effectively establishing the culture shift.

The Assessment Team determined the plan should, at a minimum, provide:

- The definition of the required metrics, the basis for selection of the metrics, combined with a discussion on how the chosen metrics align with the eight “problem areas” noted in Section 2.0 “Background.”
- Necessary baseline information for each metric to measure improved performance, or define how improvement will be measured over a time period (how much improvement is needed over how much time).
- Define desired short- and long-term performance goals such as closure of the CAR and potential Integrated Safety Management System (ISMS) integration with the performance objectives, measures, and commitments (POMC).
- How BNI will fulfill its stated intent to benchmark and attain a BNI WTP nuclear safety and quality culture equivalent to commercial nuclear power plants.

The need for the development and implementation of a defined program or plan, either through the NSQI Project or the ISMS process, for the improvement of the nuclear safety and quality culture improvements will be followed by assessment follow-up item (AFI) D-07-WED-038-A01.

4.2 METRICS TO MONITOR EFFECTIVENESS OF NSQI INITIATIVES

The Assessment Team interviewed the NSQI Project Managers and determined twelve (12) specific metrics were being used to monitor for nuclear safety and quality culture improvement. These metrics were selected because NSQI Project Managers believed these reflected behaviors

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aligned with a strong nuclear safety and quality culture (timeliness of important actions, free and timely reporting of “problems,” decrease over time of the severity of problems reported, etc.). Project Managers also indicated some difficulty in measuring change to culture using metrics. Nine of these metrics followed the Corrective Action Program data with the others listed as follows:

Correction Action Metrics

- Project Issue Evaluation Reports (PIER) metrics – volume and disposition
- Corrective Action Report (CAR) severity
- % line identification
- On-time CAR responses
- CAR responses – average days overdue
- On-time completion of CAR actions
- CAR actions overdue – average days overdue
- Action Tracking System (ATS) items open and late
- Internal ATS items

Other Metrics

- Project training timeliness
- Annual review timeliness
- Non-manual attrition data

The Assessment Team reviewed these metrics and noted performance trends as follows:

- PIER Volume and Disposition – The total number of PIERs dropped from 160 in October 2006, to 81 and 78 in November and December 2006, respectively. Since the PIER reporting system was initiated in mid-2006, the reviewers expected the volume per month to increase, reflecting that people find entry of any issue easier to do with the “one-form” system. The trend appeared to be in the reverse (negative) direction, although BNI attributed this to shorter work periods in November and December due to the holidays.
- Condition Severity Report – This metric compared the percentage of CARs against the percentage of deviation reports (DR). The desirable trend would be to have a greater proportion of DRs than CARs, indicating the severity of the conditions was decreasing. (Note: CARs involved deficiencies of some significance, while DRs involved less significant deficiencies.) Data for September through November 2006 reflected a greater proportion of CARs than DRs (a negative trend), but the metric reversed in December for the first time in that 4-month period.
- % Line Identification – This metric tracked the percentage of issues identified by the line organization versus the Quality Assurance (QA) and other outside organizations. The goal was to obtain greater than or equal to 65% line identification of issues. During October, November, and December 2006, the percent of line identification went from 61% to 65% to 71%, which was an improving trend. However, data existed back to January 2006, which indicated a relatively stable 65% of line issue identification.

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- On-time CAR responses – During 2006, there had been a slightly increasing positive trend (72% first quarter, 66% second quarter, 68 % third quarter, and 80% fourth quarter). The Assessment Team concluded this indicator was too flat to make any trend visible.
- CAR responses – Average days overdue – During 2006, the assessors concluded there was no obvious trend with data of 14.5 in the first quarter, 12.7 in the second quarter, 13.1 in the third quarter, and 14.6 in the fourth quarter.
- On-time CAR completions – During 2006, there was no obvious trend with data of 75% on time, first quarter, 78% second quarter, 68% third quarter, and 73% fourth quarter.
- Average days overdue for CAR completions – During 2006, performance in this area had improved (18 days in first quarter, 14 days in fourth quarter; there was no reporting for second or third quarter.)
- ATS Items – External commitments only –The only data available was for October through December 2006. This data indicated trends were slightly negative for both items open, and items open and late.
- Internal Action Item Timeliness – Data was reported for only December 2006. No items were late, but 40 items were awaiting originator verification of closeout action.
- Project Training Timeliness – Data was reported from July through December 2006. The general trend of this data was positive.
- Annual review timeliness – Data was reported monthly from January through December 2006. This data indicated a potential positive trend existed from July through December.
- Non-manual attrition causal data – Neither BNI nor the Assessment Team were able to make positive or negative conclusions on the data. The presentation of the metric made it difficult to identify any trends; or to interpret the meaning of changes in the causal data. The conclusion of the Assessment Team was this may not be a valid metric for use.

During interviews with the review team, the BNI NSQI Project Manager stated the NSQI Project metrics, combined with the Annual Employee Opinion Survey results, were the most appropriate methods for monitoring the nuclear safety and quality culture behavior. The Project Manager also concluded performance-monitoring activities such as the External Advisory Board and the Biweekly Monday (NSQI Steering Group) Meetings provided insights on culture change.

However, the Assessment Team was unable to conclude these metrics and activities, by themselves, were sufficient to monitor for nuclear safety and quality culture change for the following reasons:

- The metrics, in general, were not consistent with the more disciplined process of performance measures, objectives, and commitments used by the ISMS process methodology.

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- Although four different NSQI metrics monitor corrective action performance, these metrics usefulness are overshadowed by the fact the CAR procedure allows two 6-month extensions on CAR actions preventing a true picture of timing. This overshadows all metrics performance on corrective action data.
- BNI had not established performance baselines for the NSQI metrics being used to determine any short or long-term performance changes.
- The NSQI Project metrics were site-wide and as such were functionally limited since they could not be used to determine sources of problems or correction action effectiveness by discipline or function.
- The NSQI Project metrics did not include data provided by the Engineering organization, which had specific metrics in place for monitoring the quality of engineering deliverables and procedure adherence.
- The NSQI Project had no metric to monitor the adequacy of revised procedures. No metric existed for the adequacy or compliance to revised procedures. The BNI procedure revision initiative (CAR-QA-05-331 action items 30-35) needed to be completed through its final stage (item 35), followed by monthly data acquisition for the number of PIERS written on deficient procedures to provide a “procedure quality” metric.
- NSQI Project metrics did not include data developed for worker safety by the BNI Safety organization, which provided monitoring of performance in personnel/industrial safety (such metrics were included in ISMS POMCs and were noted as being applicable to nuclear safety and quality culture).
- No specific NSQI Project metric existed for monitoring Construction performance to improve nuclear safety and quality culture in areas other than input and use of the PIER system.
- The Assessment Team was unable to validate the correlation between the NSQI Project metrics and the eight performance weaknesses (see Section 2.0) cited in CAR-QA-05-331 due to lack of any analysis by BNI to this effect.

In addition to the above metric quality, adequacy, and process problems; BNI was not utilizing any additional methods for acquiring data and converting it into metrics to monitor for performance improvements in the 8 specific areas of weakness across the WTP. For example:

- Neither BNI QA nor BNI discipline organizations (Engineering, Construction, etc.) were performing surveillances against the specific weaknesses and desired behaviors on a periodic basis to provide NSQI performance data that could be translated into performance metrics.
- CAR-QA-05-331 did not identify any specific program or expectation for conducting “management observations” or “management by walking around” to obtain performance insights relative to the desired behaviors for improving the nuclear safety and quality culture. Routine supervisory oversight was also not being used to monitor for culture change on the WTP. Results of these activities could be documented and converted into a metric.

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- The External Advisory Board was not being scheduled at a specific periodicity for onsite visits and assessments. If the Board had specific lines of inquiry for observing WTP performance in the specific areas of weaknesses, its activities might serve to provide performance data for conversion into metrics for monitoring nuclear safety and quality culture.
- A surveillance or assessment by an outside agency such as Institute of Nuclear Power Operations (INPO) would provide a potential baseline for improvements and useful, independent feedback on the state of BNI's nuclear safety and quality culture, particularly since the current BNI organization has few individuals who have experience in working in and promoting such a culture. The advantage of this approach (over only using the External Advisory Board) is that INPO used a defined process with specific performance objectives to perform such an assessment. This was mentioned in the ORP letter 06-ESQ-092 from R. Schepens to B. Elkins, "Improving the Hanford Tank WTP Project Nuclear safety and quality culture," dated on July 11, 2006.

The Assessment Team concluded the NSQI Project metrics and activities, by themselves, are not sufficient to monitor for nuclear safety and quality culture change, and in particular for determining whether improvements are being made in addressing the eight WTP weaknesses BNI and ORP mutually agreed upon (as defined in CAR-QA-05-331 item CAR-331-2 and listed in Section 2.0 of this report). BNI needs to improve the adequacy and quality of the metric process and address the sufficiency of existing metrics in the NSQI process; or consider transferring the culture monitoring to the ISMS program and the metrics of the POMCs. In addition to the metrics improvements, AFI D-07-DESIGN-038-A02 will also track the closure of CAR-QA-05-331 and the transition of the long-term nuclear safety and quality culture shift monitoring via the ISMS FY 2008 Annual Declaration and assigned POMCs.

4.3 EFFECTIVENESS OF ACTIONS TO IMPROVE WTP'S NUCLEAR SAFETY AND QUALITY CULTURE

The Assessment Team reviewed NSQI Project metrics, related metrics not currently included under the NSQI Project metric set, and activities other than metrics providing insight on BNI's past and current nuclear safety and quality culture. Analysis of the twelve NSQI Project metrics through December 2006 showed some negative and positive performance trends; but the majority of the data reviewed was unable to establish any specific trend. The lack of clear trends (with potential negative trending visible) in many of the metrics suggested that NSQI initiatives may not have had sufficient time to observe any culture change, which might take years to be visible in data. The Assessment Team was also not able to establish trends due to lack of a defined process including time measure periods, what constitutes a significant or confirmed trend, etc.

One of the metrics not presently tracked by the NSQI Project was the CAR by Cause Code data, which for the last six months seems to imply an upward (negative) trend in both behavior and process cause code events. The number of events was higher than the previous six months, and this may have indicated a cultural change had not yet taken root.

Although not reported as part of the NSQI Project metrics, Engineering was monitoring procedure compliance, and Safety Assessment was monitoring industrial safety performance as well as some aspects of nuclear safety via integrated safety management POMCs. The

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assessment team's review of engineering's procedure compliance data had shown a low error rate from baseline data (recorded from April through June 2006), but the data review did not have sufficient time involved to observe any trend in performance in this area. Industrial safety performance over 2006 had shown slight improvement in the areas of Number of Days Between "Days Away From Work Cases," and "Number of Days Between Recordable Events."

The Employee Opinion Survey metric was used by the NSQI Project to identify the shift in human behavior toward improvement in the nuclear safety and quality culture. The results from 2005 to 2006 showed no change. However, the Employee Opinion Survey was performed on an infrequent basis and as such may not be a good metric indicator for short term goals. This will be the case with the re-staffing of the project for construction and engineering which is due to take place later this year. This change in the work force may extend the time needed to obtain significant cultural change.

The site visit by the External Advisory Board in October 2006 focused primarily on Engineering. The Board concluded communications on NSQI had been effective, the project had shown broad acceptance of the need for change, and Engineering metrics (not part of NSQI Project metrics) were meaningful and showed tangible improvement.

Based on the above, the assessment team concluded NSQI Project metrics were insufficient and the NSQI Project was unable to draw conclusions about its effectiveness due to the insufficient metrics and lack of time for sufficient data to analyze.

The Assessment Team concluded actions to-date to improve BNI's nuclear safety and quality culture had not yet been effective as seen by the NSQI metric data. The Assessment Team made the Observation that the lack of positive evidence confirming either a positive or negative trend in some of the NSQI Project metrics suggested NSQI initiatives had not had sufficient time for effectiveness of implementation for a change in culture (which normally takes a few years) (Observation D-07-WED-038-O03).

4.4 EVALUATION OF THE CLOSURE PROCESS FOR THE NUCLEAR SAFETY AND QUALITY ISSUE VIA CAR-QA-05-331

The Assessment Team evaluated the ability of the existing NSQI Project metrics program to effectively shift the nuclear safety and quality culture via closure of CAR-QA-05-331. CAR-QA-05-331 was developed to respond to the DOE Quality Issues Assessment (A-05-ESQ-RPPWTP-009). The Assessment Team's review of CAR-QA-05-331 determined all response actions in the CAR were tied to BNI actions, which BNI believed were needed to resolve the latent programmatic issues such as procedure adequacy and training and initiate the nuclear safety and quality culture change. However, none of the actions in the CAR allow sufficient time or process for determination that the culture shift had actually started or taken place. The Assessment Team agreed the closure of the CAR-QA-05-331 was a short-term goal for resolving legacy issues within the BNI program and was required for the nuclear safety and quality culture shift to begin. However, the CAR action statements did not provide a plan or sufficient time for implemented actions to be measured relative to the culture shift taking place, especially for items such as the effectiveness of the procedures or training.

Since CAR-QA-05-331 did not provide for the long term verification of the needed culture shift, the assessment team reviewed the ISMS process for potential tracking of this area. The ISMS

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program provided for the creation of performance objectives, measures and commitments which provided metrics for tracking. The Assessment Team reviewed a series of correspondence associated with the status of the ISMS, including BNI CCN: 144304, (which provided the ISMS Declaration of Readiness-[ISMS-D]); CCN: 129930, (which made the POMCs commitments for FY 2007); and CCN: 145311 (which provided the First Quarter FY 2007-Integrated Safety Management-System (ISMS) Performance Objectives, Measures, and Commitment (POMCs) Report).

The Assessment Team reviewed BNI CCN: 144304 which stated, "This year's (ISMS) review identified the need for only minor administrative changes in the ISMS-D; and therefore; the ISMS-D will not be revised for FY 2007." However, the report related the existence of nuclear safety and quality culture improvements, but did not mention the creation of the NSQI Project. The ISMS report did relate the existence of CAR-QA-05-331, but did not mention the NSQI Project in Sections 4.1 or 4.2 (of the ISMS POMCs report) as a project improvement. The Assessment Team concluded the report did cite the existence of the NSQI, but BNI characterized the NSQI changes as "minor administrative change," and therefore, was an insufficient basis to revise the previous year's declaration.

The Assessment Team compared the metrics in the current ISMS POMCs with those in use by the NSQI Project and found a substantial number of differences between the two sets. Specifically, the POMCs identified eight specific metrics for NSQI, which monitored the areas of corrective action performance, design procedure compliance, and procurement performance. The NSQI Project utilized one of these areas in its metrics set, but the vast majority of the NSQI metrics focused on the corrective action process and not dealing with all 8 of the specific identified areas of weakness.

The Assessment Team reviewed the BNI first quarter ISMS report (CCN: 145311) and compared the metrics included in that ISMS report (POMCs) to the metrics involved in the NSQI Project metrics. Neither the Assessment Team's metrics data analysis nor BNI management were able to provide any substantial data showing improvement in culture from the data to date.

The Assessment Team interviewed BNI management on the subject of integrated safety management under the Integrated Safety Management System (ISMS) to understand the relationship between the NSQI Project, resolution of CAR-QA-05-331, and the long-term goals of ISMS as measured by the performance objectives, measures, and commitments (POMC) as they related to the long-term NSQI culture shift. BNI indicated the possibility that when NSQI Project was completed via the closure of the CAR-QA-05-331, the culture shift monitoring effort could be continued via the ISMS Annual Readiness Declaration and subsequent POMC performance goals. The Assessment Team agreed with BNI's intention, but these POMCs should be upgraded to express BNI's continuing pursuit of the NSQI culture shift via the ISMS Annual Declaration. The Assessment Team concluded the short-term NSQI metrics should be more closely aligned to the long term ISMS POMCs for culture shift to be more easily compared.

The assessment team recommends BNI implement the closure of CAR-QA-05-331 which provides the foundation for the implementation of the desired culture shift. The effectiveness of the implementation of culture shift needs to be either defined in a project plan and tracked to completion; or reassigned to the ISMS FY08 Annual Declaration, and revision of the POMCs to formally monitor for a culture shift via a defined process. As previously mentioned in this

Assessment of the Bechtel National, Inc. Metric Program for Nuclear Safety and Culture Imperative (D-07-DESIGN-038)

report, the AFI D-07-DESIGN-038-A02 will track the closure of CAR-QA-05-331 and the transition of the long term nuclear safety and quality culture shift monitoring via the ISMS Fiscal Year (FY) 2008 Annual Declaration and assigned POMCs.

5.0 SUMMARY OF OPEN ITEMS**5.1 FINDINGS**

None.

5.2 ASSESSMENT FOLLOW-UP ITEMS

AFI D-07-DESIGN-038-A01: The existing NSQI Project had no plan in place dealing with the ORP expectation communicated in Reference 1. The need for the development and implementation of a defined program or plan, either through the NSQI Project or the ISMS process, for the improvement of the nuclear, safety, and quality culture improvements will be followed by AFI D-07-WED-038-A01.

AFI D-07-DESIGN-038-A02: NSQI Project metrics and oversight activities, by themselves, are not sufficient to monitor for nuclear safety and quality culture change, and in particular for determining whether improvements are being made in addressing the eight WTP weaknesses (CAR-QA-05-331). BNI needs to improve the quality and adequacy of the metric process and address the sufficiency of existing metrics in the NSQI process; or consider transferring the culture monitoring to the ISMS program via the metrics of the performance objectives, measures, and commitments (POMC). In addition to the metrics improvements, AFI D-07-DESIGN-038-A02 will also track the closure of CAR-QA-05-331 and the transition of the long-term nuclear safety and quality culture shift monitoring via the ISMS fiscal year (FY) 2008 Annual Declaration and assigned POMCs.

5.3 OBSERVATIONS

Actions to-date to improve BNI's nuclear safety and quality culture had not yet been effective as seen by the NSQI metric data. The lack of positive evidence confirming either a positive or negative trend in some of the NSQI Project metrics suggested NSQI initiatives had not had sufficient time to effectively implement a change in culture (which normally takes a few years) (Observation D-07-WED-038-O03).

6.0 REFERENCES AND PERSONNEL CONTACTED**6.1 REFERENCES**

1. 06-ESQ-092, ORP letter, R. Schepens to B. Elkins, "Improving the Hanford Tank WTP Project Nuclear safety and quality culture," dated July 11, 2006
2. 24590-WTP-GPG-ENG-0096, Guide: *Engineering Condition Report Management, Trending, and Follow-up*, Rev. 2, December 14, 2006
3. 24590-WTP-PL-MGT-06-0001, *WTP Nuclear Safety and Quality Imperative*, Rev. 1, May 1, 2006
4. CCN: 129864, memo, S. VanDyke to G. Clare, "Implementation Plan for Improving Adequacy of Procedures," dated May 31, 2006

Assessment of the Bechtel National, Inc. Metric Program for Nuclear Safety and Culture Imperative (D-07-DESIGN-038)

5. CCN: 135266, memo, M.J. Heaton to G. Clare, "Nuclear Safety and Quality Imperative Survey Project Update," dated June 14, 2006
6. CCN: 135272, letter, J.P. Henschel to R.J. Schepens, "Transmittal of Initial Hanford Task Waste Treatment and Immobilization Plant Nuclear Safety and Quality Culture Change Initiative Status Report," dated February 1/February 7, 2006
7. CCN: 135280, memo, M.J. Heaton to G. Clare, "Project Survey and Behavioral Action Plans," dated September 26, 2006
8. CCN: 137466, memo, G. Hill to G. Clare, "Implementation Plan for Improving the Training Program at WTP," dated June 15, 2006
9. CCN: 138904, memo, D.J. Pisarcik to S.C. Lynch, "Procedure Compliance Leading Indicator Metrics," dated June 28, 2006
10. CCN: 143534, memo, M.J. Heaton to G. Clare, "Behavioral Gap Completion and Subsequent Actions to Improve Management Behaviors at WTP," dated August 10, 2006
11. CCN: 144304, letter, W.S. Elkins to R.J. Schepens, "Contract No. DE-AC27-01RV14136 – Hanford Tank Waste Treatment and Immobilization Plant – Fiscal Year 2007 – Integrated Safety Management System (ISMS) Declaration of Readiness Report," dated August 24, 2006
12. CCN: 148013, letter, W.S. Elkins to R.J. Schepens, "Nuclear Safety and Quality Imperative Project Summary of Accomplishments-December 2006"
13. CCN: 148713, letter, W.S. Elkins to R.J. Schepens, Hanford Waste Treatment and Immobilization Plant Project, "WTP Corrective Action Program Trend Report-Third Quarter 2006," dated December 22, 2006
14. CCN: 148788, email Phase II/III procedure recovery plan
15. Corrective Action Report Number 24590-CAR-QA-05-331, Rev.0
16. Course, 24590-WTP-CBT-TRA-000133, Rev. 0, "Employee Overview-A Rev. 0 Questioning Attitude- The Manager's Role in Supporting Open Communications," October 2006
17. Course, 24590-WTP-CRM-TRA-000132, Rev. 0 A, "Questioning Attitude," February 1, 2006
18. Engineering Quality Presentations, June, July, September, October, and November 2006
19. FY 2006 Annual Engineering Management Assessment, December 7, 2006
20. Leading Indicator Metrics Checklists, August 30, 2006
21. Leading Indicator Metrics, 24590-WTP-RITS-QAIS-06-698, entry date June 6, 2006
22. NSQI Project Update Presentation, G. Clare, January 2007
23. NSQI Recognition Field Operatives Presentation
24. Presentation NSQI Metrics for December 2006
25. Waste Treatment Plant 2006 Opinion Survey, prepared by T.C. Stewart, July 2006

Assessment of the Bechtel National, Inc. Metric Program for Nuclear Safety and Culture Imperative (D-07-DESIGN-038)

6.2 PERSONNEL CONTACTED

T. Bice
G. H. Clare
M. Ehlinger
M. Ensminger
D. Gergely
M. J. Heaton
L. Ivey
D. J. Jantosik
D. G. McKenzie
C. Meyer
D. Pisarcik
P. W. Schuetz
T. C. Stewart

Attachment
07-WTP-083

Assessment of the Bechtel National, Inc. Metric Program for Nuclear Safety and Culture Imperative (D-07-DESIGN-038)

APPENDIX A

WTP ENGINEERING DIVISION DESIGN OVERSIGHT PLAN FOR THE REVIEW OF BNI METRIC PROGRAM FOR NUCLEAR SAFETY AND CULTURE IMPERATIVE

Assessment of the Bechtel National, Inc. Metric Program for Nuclear Safety and Culture Imperative (D-07-DESIGN-038)

DESIGN PRODUCT OVERSIGHT PLAN

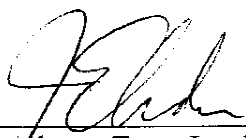
**WTP ENGINEERING DIVISION DESIGN OVERSIGHT OF BNI METRIC PROGRAM
FOR NUCLEAR SAFETY AND CULTURE IMPERATIVE**

February 2007

Design Oversight: D-06-DESIGN-038, Rev. 1

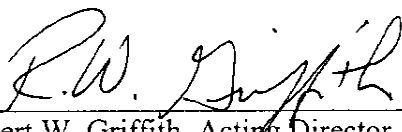
Team Lead: James E. Adams

Submitted by:



James E. Adams, Team Lead
WTP Engineering Division
Date 04/10/2007

Concurrence:



Robert W. Griffith, Acting Director
WTP Engineering Division
Date 4/10/07

Assessment of the Bechtel National, Inc. Metric Program for Nuclear Safety and Culture Imperative (D-07-DESIGN-038)

1.0 BACKGROUND, PURPOSE AND OBJECTIVES

1.1 Background

The Waste Engineering Division (WED) has primary responsibility for design oversight of the Waste Treatment and Immobilization Plant (WTP) Project and has been actively performing this oversight since April 2003. Bechtel National, Inc. (BNI) has initiated a Nuclear Safety and Quality Imperative (NSQI) to establish and maintain a strong nuclear culture through a deliberate, discipline application of proven methods focused on training, procedures, behaviors, and self-assessments. NSQI is being managed as a subproject with its own schedule of activities and milestones. Using quality metrics, BNI is measuring progress of the nuclear quality safety initiative. This assessment reviews the BNI metrics used to gauge the NSQI progress and to evaluate this initiative results.

1.2 Purpose

This design process oversight will focus on the establishment and use of the metrics to measure nuclear safety and quality culture and specifics of the results of the metrics. The results of this assessment will be provided as input to the U.S. Department of Energy, Office of River Protection (ORP) Environmental Safety and Quality (ESQ) organization as input to the closure of the original Finding.

1.3 Objectives

The following are the specific objectives of this oversight:

1. Evaluate whether BNI has a project plan for both short term and long term improvement of the nuclear safety and quality culture for the WTP.
2. Evaluate the adequacy of the present NSQI Project metrics being used to measure the effectiveness of NSQI initiatives.
3. Evaluate whether actions to date have been effective in improving WTP's nuclear safety and quality culture.
4. Evaluate whether BNI's closure of the NSQI CAR-QA-05-331 (tracks the BNI actions for improvement of BNI nuclear safety and quality culture) will be effective in providing the desired effect of a measurable nuclear safety and quality culture shift through the existing NSQI Project.

2.0 PROCESS

This oversight shall be conducted within the guidelines of ORP M 220.1, *Integrated Assessment Plan*, and the ORP Desk Instruction DI 220.1 "Conduct of Design Oversight," Rev. 1. as revised January 13, 2006.

2.1 Scope

This oversight will include review of the quality metrics used to measure changes in the BNI culture based on the NSQI changes. This includes plans, procedures, selection and

Assessment of the Bechtel National, Inc. Metric Program for Nuclear Safety and Culture Imperative (D-07-DESIGN-038)

monitoring of metrics, and problem reporting attributable to the metrics corrective action effectiveness, etc.

2.2 Preparation

1. Identify the assessment team involved in the review of assessments.
2. Obtain the plans, procedures, and metrics identified and rational for the metrics.
3. Request interviews of key personnel in the organization collecting and analyzing metrics.
4. Review all data in preparation for entrance and field interviews.

2.3 Review

This oversight provides data for a determination of the progress BNI has made with the NSQI initiative. In addition, it will make recommendations for resolution of issues of procedure compliance, training, and management based on evaluation of the metric program.

1. De-brief ORP management periodically, as required.
2. Prepare a draft report that summarizes the activities, the results, conclusions, and recommendations of the assessment.
3. Issue the Draft Design Oversight Report for review and comment of ORP management and cognizant Contractor personnel, if necessary.

The final report will resolve comments received on the draft report.

3.0 SCHEDULE OF ACTIVITIES

Table 2 summarizes the schedule for completion of this oversight.

4.0 DOCUMENTATION

The final report of this task shall contain the sections and content as summarized in ORP DI 220.1, "Conduct of Design Oversight," Rev. 1 draft as revised March 2006.

The issues identified in this oversight shall be listed in the final report. Each issue shall be assigned a type of issue and an item number for tracking to resolution through the Consolidated Action Reporting System (CARS).

5.0 CLOSURE

The Team Lead with concurrence of the Director shall confirm that the items from this oversight are adequately resolved.

Assessment of the Bechtel National, Inc. Metric Program for Nuclear Safety and Culture Imperative (D-07-DESIGN-038)**Table 1 – Initial Information Requirements**

| | |
|----|---|
| 1. | Presentation on development of metric program for oversight of NSQI for procedures, training, and management. |
| 2. | Copies of all metric procedures, plans, or processes used to provide metric analysis for NSQI. |
| 3. | Copies of all reports and results of metric analysis including generation of problem reports showing issue developed via metrics determination. |
| 4. | Copies of assessments or oversight associated with NSQI initiative or topics covered by NSQI. |

Table 2 – Schedule

| Activity Description | Responsibility | Complete By |
|---|--|-----------------------|
| Develop Design Oversight Plan | Adams | 01/12/07 |
| Identify Team members | Adams/Woods/Cooper | 01/12/07 |
| Obtain approved plan | Eschenberg/Miller | 01/19/07 |
| Obtain initial information defined in Table 1 above to support review and provide to team members | Adams | 01/22/07 |
| Qualify Team members-Attachment 9.1 | Adams/Miller | 01/22/07 |
| Kick-off meeting with team to outline objectives, scope, schedule, and establish points of contact | Team | 01/22/07 |
| Review documents from ORP and provide oversight strategy, lines of inquiry, and interview requests to team lead | Team | 01/22/07 |
| Perform metric analysis | Cooper-Review metric program for feasibility Woods-Review implementation of metrics for effectiveness | 01/22/07- 02/02/07 |
| Prepare Draft Design Oversight Report Notes | Cooper Woods | 02/02/07 03/09/07 |
| ORP Exit Briefing | Team and WED Management | 02/02/07 |
| Draft Report | Adams | 02/16/07 |
| Resolve comments and place Final Report into concurrence including factual accuracy review with Contractor | Adams | 02/28/07 |
| Issue Final Report | Adams | 03/09/07 |

Task# ORP-WTP-2007-0088

E-STARS™ Report
 Task Detail Report
 04/30/2007 0953

TASK INFORMATION

| | | | |
|-------------------------|--|-------------------------|--------|
| Task# | ORP-WTP-2007-0088 | | |
| Subject | (Concur 07-WTP-083) TRANSMITTAL OF THE U.S. DEPARTMENT OF ENERGY, OFFICE OF RIVER PROTECTION (ORP) DESIGN OVERSIGHT REPORT: WASTE ENGINEERING DIVISION ASSESSMENT OF THE BECHTEL NATIONAL, INC. (BNI) METRIC PROGRAM FOR NUCLEAR SAFETY AND CULTURE IMPERATIVE (D-07-DESIGN-038) | | |
| Parent Task# | | Status | CLOSED |
| Reference | | Due | |
| Originator | Licht, Sarah | Priority | High |
| Originator Phone | (509) 373-0068 | Category | None |
| Origination Date | 03/14/2007 1106 | Generic1 | |
| Remote Task# | | Generic2 | |
| Deliverable | None | Generic3 | |
| Class | None | View Permissions | Normal |
| Instructions | Hard copy of the correspondence is being routed for concurrence. Once you have reviewed the correspondence, please approve or disapprove via E-STARS and route to the next person on the list. Thank you. bcc: MGR RDG file WTP OFF file WTP RGD file M. K. Barrett, AMD J. E. Adams, WTP J. R. Eschenberg, WTP | | |

ROUTING LISTS

| | | |
|---|---|----------|
| 1 | Route List | Inactive |
| | <ul style="list-style-type: none"> ● Adams, Jim E - Review - Concur with comments - 03/15/2007 1006 <i>Instructions:</i> | |
| | <ul style="list-style-type: none"> ● Miller, Lewis F - Review - Withdrawn - 04/10/2007 1404 <i>Instructions:</i> | |
| | <ul style="list-style-type: none"> ● Barrett, Michael K - Review - Concur with comments - 04/11/2007 1349 <i>Instructions:</i> | |
| | <ul style="list-style-type: none"> ● Eschenberg, John R - Review - Concur - 04/17/2007 1616 <i>Instructions:</i> | |
| | <ul style="list-style-type: none"> ● Olinger, Shirley J - Review - Cancelled - 04/30/2007 0953 <i>Instructions:</i> | |
| | <ul style="list-style-type: none"> ● Eschenberg, John R - Approve - Approved - 04/30/2007 0953 <i>Instructions:</i> | |
| | <ul style="list-style-type: none"> ● Griffith, Robert W - Review - Concur with comments - 04/18/2007 1406 <i>Instructions:</i> | |

RECEIVED

APR 30 2007

DOE-ORP/ORPCC

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| Task# ORP-WTP-2007-0088 |
|--------------------------------|

ATTACHMENTS

| | |
|-------------|--|
| Attachments | <ol style="list-style-type: none"> 1. 07-WTP-083.JEA.Albert.doc 2. 07-WTP-083.JEA.Attach.D-07-DESIGN-038Rev1.doc |
|-------------|--|

COLLABORATION**COMMENTS**

| | |
|---------------|---|
| Poster | Adams, Jim E (Adams, Jim E) - 03/15/2007 1003 |
|---------------|---|

| | |
|--|--------|
| | Concur |
|--|--------|

| | |
|--|--|
| | Comments already incorporated and files upgraded |
|--|--|

| | |
|---------------|---|
| Poster | Barrett, Michael K (Derryberry, Lori) - 04/11/2007 0104 |
|---------------|---|

| | |
|--|--------|
| | Concur |
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| | |
|--|----------------------------|
| | concur, add COR disclaimer |
|--|----------------------------|

| | |
|---------------|---|
| Poster | Griffith, Robert W (Griffith, Robert W) - 04/18/2007 0204 |
|---------------|---|

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| | Concur |
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| | Concurred with comments. |
|--|--------------------------|

TASK DUE DATE HISTORY

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|----------------------------|
| <i>No Due Date History</i> |
|----------------------------|

SUB TASK HISTORY

| |
|--------------------|
| <i>No Subtasks</i> |
|--------------------|

-- end of report --

Task# ORP-WTP-2007-0088

E-STARS™ Report
 Task Detail Report
 03/14/2007 1110

TASK INFORMATION

| | | | |
|-------------------------|--|-------------------------|--------|
| Task# | ORP-WTP-2007-0088 | | |
| Subject | (Concur 07-WTP-083) TRANSMITTAL OF THE U.S. DEPARTMENT OF ENERGY, OFFICE OF RIVER PROTECTION (ORP) DESIGN OVERSIGHT REPORT: WASTE ENGINEERING DIVISION ASSESSMENT OF THE BECHTEL NATIONAL, INC. (BNI) METRIC PROGRAM FOR NUCLEAR SAFETY AND CULTURE IMPERATIVE (D-07-DESIGN-038) | | |
| Parent Task# | | Status | Open |
| Reference | | Due | |
| Originator | Licht, Sarah | Priority | High |
| Originator Phone | (509) 376-9025 | Category | None |
| Origination Date | 03/14/2007 1106 | Generic1 | |
| Remote Task# | | Generic2 | |
| Deliverable | None | Generic3 | |
| Class | None | View Permissions | Normal |
| Instructions | Hard copy of the correspondence is being routed for concurrence. Once you have reviewed the correspondence, please approve or disapprove via E-STARS and route to the next person on the list. Thank you. bcc: MGR RDG file WTP OFF file WTP RGD file M. K. Barrett, AMD J. E. Adams, WTP J. R. Eschenberg, WTP | | |

ROUTING LISTS

| | | |
|---|------------|--------|
| 1 | Route List | Active |
|---|------------|--------|

- Adams, Jim E - Review - Awaiting Response
Instructions: *3/15/07*
- *Bob Griffin*
~~Miller, Lewis F - Review - Awaiting Response~~
Instructions: *4/27/2007*
- Barrett, Michael K - Review - Awaiting Response
Instructions: *7MB 4-11-07 add COE disclaimer*
- Eschenberg, John R - Review - Awaiting Response
Instructions: *9/17/06*
- Olinger, Shirley J - Review - Awaiting Response
Instructions: *AS*
- Eschenberg, John R - Approve - Awaiting Response
Instructions:

ATTACHMENTS

| | |
|-------------|------------------------------|
| Attachments | 1. 07-WTP-083.JEA.Albert.doc |
|-------------|------------------------------|

R 4/25
Rec'd 4/12/07
Rec'd 4/27/07

Task# ORP-WTP-2007-0088

2. 07-WTP-083.JEA.Attach.D-07-DESIGN-038Rev1.doc

COLLABORATION

COMMENTS

No Comments

TASK DUE DATE HISTORY

No Due Date History

SUB TASK HISTORY

No Subtasks

-- end of report --