# Department of Energy
## National Nuclear Security Administration
Washington, DC 20585

April 5, 2004

The Honorable John T. Conway
Chairman
Defense Nuclear Facilities Safety Board
625 Indiana Avenue, NW.
Suite 700
Washington, D.C. 20004

Dear Mr. Chairman:

In my May 23, 2003, response to your March 25, 2003 letter, regarding Software Quality Assurance (SQA) deficiencies at the Pantex Site Office (PXSO), we indicated that if all planned actions were not completed by February 28, 2004, we would provide you an update on the status. The enclosed PXSO memorandum indicates that BWXT has completed all the actions to improve the SQA of the Move Right System. The SQA lessons learned from the Move Right System are being applied and incorporated in the Interactive Electronic Procedure System.

This letter completes actions required in response to your letter of March 25, 2003.

If you have any questions, please contact me or have your staff contact Jeff Underwood at (301) 903-8303 or Steve Erhart at (806) 477-6150.

Sincerely,

FOR

Everet H. Beckner
Deputy Administrator
for Defense Programs

Enclosures

cc w/enclosures:
M. Whitaker, DR-1
J. McConnell, DNFSB
W. Andrews, DNFSB

United States Government

Department of Energy

# memorandum

DATE: **MAR 12 2004**

REPLY TO
ATTN OF: PXSO:AMOA:MWR

SUBJECT: Software Quality Assurance (SQA) Deficiencies at Pantex

TO. Everet H. Beckner, Deputy Administrator, Defense Programs, NA-10/FORS

REFERENCE:
a) DNFSB letter, Conway/Brooks, *establishing a 30-day reporting requirement regarding Software Quality Assurance at Pantex*, dated March 25, 2003
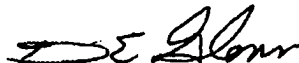b) HQ letter, Beckner/Conway, *regarding Software Quality Assurance deficiencies at Pantex*, dated May 23, 2003

Reference (a) identified DNFSB concerns with SQA deficiencies at Pantex. Reference (b) forwarded NNSA's evaluation of the proposed BWXT actions and identified that an update would be provided if all actions were not complete by February 28, 2004. Reference (b) included actions for the Move Right System, Interactive Electronic Procedure (IEP) System and Software Quality Assurance.

BWXT provided me an update on actions to improve and implement the SQA process at Pantex. Briefly, BWXT has completed all the committed actions for both the Move Right System and the SQA process. The scheduled completion of most of the previously identified actions for the IEP System have been delayed primarily due to vendor software programming issues. The lessons learned from the implementation of SQA in the Move Right System are being applied to the IEP System. My staff has briefed the DNFSB Staff and Pantex Site Representative on the status of the open IEP actions.

The Pantex Site Office is closely following BWXT's actions in improving the SQA process at Pantex. Please contact Karl Waltzer of my staff at (806) 477-3148, if you have any questions.

Daniel E. Glenn
Manager

cc:
S. Erhart, PXSO, 12-36A
K. Waltzer, PXSO, 12-36A
J. Kirby, PXSO, 12-36A

M. Mallory, BWXT, 12-69
J. Underwood, NA-124/GTN

S: AMOA/2004memos/15970

# PBWXT
# Pantex

P.O. Box 30020 Amarillo, Texas 79120 P

**FEB 2 7 2004**

Mr. Daniel E. Glenn, Manager
U.S. Department of Energy
National Nuclear Security Administration
Pantex Site Office
P.O. Box 30030
Amarillo, TX 79120-0030

Action Officer:

*Walter*

Subject: Status of Move Right System, Interactive Electronic Procedures System & Software Quality Assurance Concerns cited by DNFSB and NNSA PXSO

Reference 1: BWXT Pantex letter to Dan Glenn from Michael Mallory, "NNSA/PXSO Memorandum, Glenn to Mallory, dated May 1, 2003, Comments to BWXT Pantex Response to Move Right System, Interactive Electronic Procedures System & Software Quality Assurance Concerns Cited by DNFSB and NNSA PXSO", dated May 12, 2003

Reference 2: BWXT Pantex letter to Dan Glenn from Michael Mallory, "BWXT Pantex Software Quality Assurance Implementation Plan", dated September 29, 2003

Reference 3: BWXT Pantex letter to Dan Glenn from Michael Mallory, "NNSA/PXSO Memorandum, Glenn to Mallory, dated May 1, 2003, Comments to BWXT Pantex Response to Move Right System, Interactive Electronic Procedure System & Software Quality Assurance Concerns Cited by DNFSB and NNSA PXSO", dated January 14, 2004

Reference 4: Noncompliance Report NTS-2003-0006 – Software Quality Assurance Weakness in Safety Related Software Development

Dear Mr. Glenn:

BWXT Pantex has been working diligently to meet all deliverables defined in my letter dated May 12, 2003, related to Move Right, Interactive Electronic Procedures, and Software Quality Assurance (SQA). Additionally, there have been other communications to your office related to SQA that I would like to address so that we clearly communicate our commitments regarding the actions that will enable us to become a NWC leader in Software Quality Assurance.

Move Right has made steady progress on actions defined in the May 12, 2003, letter (Reference 1). A Move Right Focus Group with membership from business and technical organizations was established in December to complete the remaining commitments. On January 14, 2004, another letter (Reference 3) was forwarded detailing the remaining work and path forward for its completion. Additionally, a 6 Sigma Black Belt was assigned who facilitated the completion of a Failure Modes and Effects Analysis (FMEA). Through this FMEA, system testing, and the human factors study, several enhancements have been identified. These enhancements will be prioritized and a schedule will be created for their implementation after the current SQA documentation is completed. See Appendix A for detailed information regarding Move Right activities and the status of the identified actions.

GM-04-22509-0179-GM

The IEP Project Team has been actively addressing the identified concerns. Appendix C contains in-depth status updates/action plans for each of these initiatives.

The SQA Implementation Team has made significant progress over the last several months in Software Quality Assurance. This team has developed and is executing an implementation plan which addresses identification and validation of systems which require SQA as well as creation of required documents for all level 1 and 2 systems. We have trained over 150 BWXT and DOE personnel on SQA principals and the implementation strategy of these principles at Pantex (Reference 4; CA #6). As of February 23, 2004, we have identified over 2100 software systems at Pantex and we are aggressively validating the categorization of these systems. See Appendix B for additional information on the status of our implementation of SQA.

If you have specific questions regarding our actions, please have your staff contact Mike Andrew (SQA) 477-3554, Roger Ward (SQA) 477-4453, Jackie Marcum (Move Right) 477-4663, or Holly Haines (IEP) 477-4062.

Very truly yours,

Michael B. Mallory
General Manager

Attachments: As stated

cc:     M. Padilla, PXSO, 12-36
        K. Waltzer, PXSO, 12-36
        G. Baker, PXSO, 12-36
        C. Durham, Eng., 12-6F
        G. Pool, PSI, 12-69C
        J. Woolery, Q&PA, 12-6D
        J. Marcum, PSI, 12-69C
        H. Haines, Eng., 12-6F
        R. Ward Q&PA, 12-132
        B. Pascal, IT, 12-106
        M. Andrew, IT, 12-106
        B. Crabtree, IT, 12-106

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**APPENDIX A**
**SUMMARY OF MOVERIGHT SYSTEM**
**SQA ACTION PLAN**
**UPDATED 2/23/2004**

| Actions | Scheduled/Revised Completion | Completion Date | Comments |
|---|---|---|---|
| Daily check comparing the material in the CAS Inventory location with the MRS Inventory location | 6/30/2003 | 6/30/03 | Daily report generated (ND number |
| Create Operator Aid as a checklist in the Operations Center to validate the number of items authorized in the computer system for movement and for the OC personnel to check the printer for any error messages that would stop the move. | No date assigned in letter | Completed | ORPS ALO-AO-BWXT-Pantex-2003-007 |
| Provide training to OC personnel and Transportation personnel on validation of the move authorization | No date assigned in letter | Completed | ORPS ALO-AO-BWXT-Pantex-2003-007 |
| Initiate change request for the MRS to enhance MRS interface with TrackRight | No Date assigned in letter | ND 3473 5/12/03 | ORPS ALO-AO-BWXT-Pantex-2003-007 |
| Created a corrective action plan to provide documentation for Roles & Responsibilities and clarify SQA requirements | No Date assigned in letter | 8/14/03 | NCR 29008184 Closed with MoveRight Manual 293093 |
| Develop and document the process for making changes to the MRS software as required during the process of SQA upgrades | 6/2/03 | Completed 6/2/03 | |
| Create a plan to validate MRS system data | 6/2/03 | 6/2/03 | Part of ORPS report 2003-0019 |
| Publish the MRS Safety Plan | 6/30/03 (O) | 2/27/04 | Issue A was published. Issue B will be published in Feb, 2004. |
| Provide NNSA/PXSO a Primavera Resource Loaded Schedule for plan activities | 7/30/03 | Completed | Gave in a letter with copy of plan |
| Perform a Gap Analysis between the current MoveRight SQA Documentation and the new SQA Program requirements. | 8/15/03 | Completed | Provide a closure package to PXSO in a letter from PS&I |
| Upgrade the Requirements Specifications to include the entire move "system", which would include all software that interfaces with MRS | 10/01/03 (O) 1/15/04 (R) | 1/15/04 | Provided to PXSO in part of a closure package |
| Perform a comprehensive human factors evaluation of the entire move system and publish the evaluation report | 1/15/04 | 1/15/04 | |

| Actions | Scheduled/Revised Completion | Completion Date | Comments |
|---|---|---|---|
| Create and perform testing and validation of the Move Right System and the entire architectural structure of CAS, TrackRight, and MRS Interfaces | 1/15/04 (O) 2/27/04 (R) | 2/27/04 | Documents submitted 1/15/2004: Requirements Document; Material List, Maintenance Plan, SQA Plan, and Human Factors Study. Documents Scheduled to be submitted 2/27/04: Detailed Design Document, Safety Plan, Test Plan, and User Documentation. |

O – Original   R - Revised

## APPENDIX B
## SQA IMPLEMENTATION INITIATIVES
### 2/23/2004

The BWXT Pantex SQA program has seen significant progress over the last several months in Software Quality Assurance initiatives. The foundation of our plan was based on a training program built on sound, industry standard SQA principals. Training of the initial 100 BWXT and DOE employees was completed in December, 2003. As of February 23, 2003, we have training approximately 150 people. The remaining plant personnel who need to be trained will receive this training by the 3$^{rd}$ quarter of FY04.

BWXT has taken a significant, aggressive action to identify all software (not just safety related) used at the facility. We completed the collection phase (over 2100 items identified) and are currently validating the categorization of all software.

We are also researching business tools that will accelerate our vision of becoming the leader in SQA within the NWC complex.

Recognizing that your staff has both SQA oversite responsibilities and their own software development efforts, I am extending an offer for PXSO personnel to attend all SQA training being conducted by BWXT Pantex. This training will be the framework by which we not only identify and validate the categorization of our inventory but also the training that establishes the new criteria for quality software development. If you, or any of your staff, have an interest in attending this training, please contact Mike Andrew.

Attached is a table that was generated to consolidate all SQA commitments into a single, comprehensive list.

## SQA IMPLEMENTATION ACTIONS
### 2/23/2004

| Description | Scheduled / Revised Completion Date | Actual Completion Date | Comments |
|---|---|---|---|
| Implement SQA Training for Plant Personnel (from Reference 1) | September 2003 (O) | September 2003 | The intent of this deliverable was to establish a contract for SQA training. In mid-September, BWXT Pantex established an outside contract to train plant personnel on both industry standard SQA principals and our internal operating procedures. We have expanded this training to incorporate our SQA manuals and templates and we delivered the first training class to developers and division points of contact on November 20-21, 2003. |
| Division Points of Contact (DPOC) Training on Inventory Collection --(Reference 2) | October 2003 (O) | October 2003 | Training material was developed and delivered in two training classes to all DPOC's in October, 2003. |
| Topical Subject Matter Expert (TSME) Training on Software Categorization (Reference 2) | November 2003 | November 2003 | TSME training was delivered in November, 2003. |
| Train Plant personnel on the SQA Program (Reference 4) | June 2004 | - | On Schedule. BWXT Pantex has currently identified approximately 200 personnel that require training on our SQA program. We will validate our training list with information collected during the software inventory identification/ categorization process and adjust our SQA Program training candidate list and complete required training by the target date. |
| Establish dates for documents to be completed for Level 1 & 2 systems | April 2004 | | |
| Complete Level 1 & 2 systems documentation | This date will be established when the system quality levels have been validated and the dates have been identified for all required documents (per system) | | |
| Create a project plan to address Level 3 systems | June 2004 | | |

**APPENDIX C**
**SUMMARY OF INTERACTIVE ELECTRONIC PROCEDURES**
**2/23/2004**

Since our last communication, the Interactive Electronic Procedures project has seen some significant progress toward implementation as well as some unexpected hurdles.

Major IEP Project Milestones Accomplished:
- All formal IEP training materials (34 documents) have been approved and issued.
- All user documentation (Plant Standard for roles & responsibilities, IOP for system administration, and 5 user manuals) have been approved and issued.
- All 18 material lists, 17 design documents, and 8 test plans have been approved and issued.
- Each issued SQA document has 1-3 formal peer reviews, POC review & approval, and SQA Program Office review & approval.
- The remaining 16 Pantex SQA documents are all drafted and in the review process using STD-1875 issue 9 and the SQA Manuals. This includes the Requirements Specification (Issue B), SQA Plan (Issue C), Maintenance Plan, Installation Plan, Safety Plan, Solumina Design Description, and 10 Test Plans.
- 20 multi-site SQA documents have been approved and issued for remote access from the Labs and qualification activity.
- Completed initial training for all twelve groups of IEP users including Design Agency reviewers.
- Qualification activity has begun toward all six QERs: Base Level (CM/SQA) is 50% complete; Application Level has completed Phase 2; Context level has evaluated training; Remote access has processes in place for installation, maintenance, and testing of Solumina from all three Labs.
- The AB change package for the IEP touchscreen was submitted to PXSO in December 2003.

Project Hurdles:
- An unexpected delay from iBASEt, the Solumina software vendor, has resulted in a 3-month delay to our production implementation.
- New Plant SQA guidance (Plant Standard and 8 Manuals) required reformatting and reissue of most documents. All Material Lists, Design Documents, and Test Plans will be reissued to meet this guidance.

### SUMMARY OF INTERACTIVE ELECTRONIC PROCEDURES
### (IEP) SQA ACTION PLAN
### UPDATED 1/19/2004

| Actions | Original Scheduled Completion | Revised Scheduled Completion | Actual Completion Date | Comments |
|---|---|---|---|---|
| Complete Human Factors evaluation of the IEP Solumina shop floor interface and publish evaluation report (SNL/LANL) | 5/31/2003 | 6/30/2003 | 6/20/2003 | LA-UR-03-4006 published by LANL |
| Provide a revised resource-loaded schedule for SQA plan activities to NNSA/PXSO. | 1/21/2004 | 1/21/2004 | 1/21/2004 | Attached |
| Perform GAP Analysis between the current IEP SQA Documentation and the new SQA Program requirements | 6/30/2003 | 8/30/2003 | 8/11/2003 | Complete |
| Publish all IEP Solumina SQA documentation with all necessary reviews and approvals. | 6/30/2003 | 3/15/2004 | | Scheduled completion date revised to incorporate approved SQA Plant Standard 1875 and SQA guidance manuals into IEP documents; and new vendor software |
| Complete Validation Testing of IEP System. This includes validation of COTS Solumina software, Pantex customization, and all system interfaces. Testing will be performed twice, once for validation of software, and second time for validation of the migration package. | 3/30/2004 | 5/15/2004 | | Schedule adjusted to support vendor delivery of new software release |
| Complete Qualification of the IEP Solumina system by issuing three QERs: one each for software components, application functionality, and the system context (SNL/LANL/LLNL). | 7/30/2003 | 5/30/2004 | | Schedule adjusted to support vendor delivery of new software release |
| Complete Remote Access Qualification of the IEP Solumina system by issuing three QERs: one for each remote site (SNL/LANL/LLNL). | 7/30/2003 | 6/20/2004 | | Qualification activity split into two deliverables to better reflect work accomplished. |
| Complete Readiness Verification of the IEP Solumina System by issuing BWXT Pantex readiness letter. | 7/30/2003 | 5/31/2004 | | Schedule adjusted to support vendor delivery of new software release |

| Actions | Original Scheduled Completion | Revised Scheduled Completion | Actual Completion Date | Comments |
|---|---|---|---|---|
| Complete IEP Nuclear Explosive Safety Master Study (NESS). | 5/30/2004 | 7/15/2004 | | Schedule adjusted to support vendor delivery of new software release |
| Receive NNSA approval of IEP NESS | 6/30/2004 | 8/30/2004 | | Schedule adjusted to support vendor delivery of new software release |