

TO: Ron Strykowski DATE: April 23, 2009
FROM: Judy Malsbury SUBJECT: NCSX Document Archiving Review

On Wednesday, April 15, 2009, a review of the NCSX Document Archiving Plan was performed. The review team consists of:

Judy Malsbury, PPPL Quality Assurance, Chair

Mark Ratliff, Princeton University's Digital Repository Architect

Wayne Reiersen, PPPL, former Chief Engineer for NCSX

Harry Towner, PPPL Head, Operations & User Support, Information Technology

The review team listened to presentations by Ron Strykowski and Bob Simmons (with questions) and interviewed Jim Chrzanowski (oversight of Drafting), Tom Brown (Pro/E, Intralink, models), Art Brooks (analysis engineer), and Cheryl Such (Operations Center). This memorandum documents the results of this review with respect to the charge.

The charge for in normal font and the results of this review in italics are:

1. Is the content sufficiently complete? What's missing?
NCSX has a complete records system that has been used by the project since its inception. In addition to records added to this system during the design and fabrication phases, the project has made a diligent effort to capture all other data and records that may be valuable should the project be restarted. This was done by requesting that all responsible managers provide close-out reports which identified the status of the work activity and assurance that all relevant information has been added to the NCSX records system. While the review team could not verify that all potentially important data were added to the system, we are comfortable with the approach.
2. Does the index logic enable rapid location and retrieval of specific information?
[Electronic records] The system for the storage of electronic records has been in place since the project inception and has worked well. As long as the linkages on the NCSX webpage remain active, the data should be accessible. Please be aware that when the NSTX project became operational, the link to all the design data disappeared. Note that the "In-process drawings" tab on the NCSX Engineering web page does not work.
[Hardcopy records] Paper records associated with the fabrication of modular coils, TF coils, and the vacuum vessel segments are located in fireproof cabinets in the Operations Center. In additional, paper records associated with creating the three pack of coils and moving the three pack over one of the vacuum vessel segments are stored in these cabinets.

3. Are storage media (both electronic and hard copy) adequately protected against damage and loss for a period up to 15 years?
(Electronic) The review team believes that the normal IT backup processes would assure protection against damage and loss. We recommend that, in order to assure the configuration of the electronic files and data, write access to this data be limited to the fewest number of people necessary (ideally this would be a single primary with single backup) and that processes be established to freeze this data while also allowing changes to be made with documented justification. Should changes be required, it is recommended that the original files be maintained along with the revised files.
(Hard copy) All NCSX hardcopy files are stored in four fireproof cabinets located in the Operations Center. It is recommended that these files be locked and the keys maintained by the project in a protected location. In some of these cabinets, radiological films are stored on shelves above paper records. Should there be a fire, it is possible that the films will melt and, as a result, damage the paper records. Consideration should be given to the impact of having different media, films and paper, in the same cabinets should a fire occur.
4. Are the risks of software obsolescence adequately assessed and mitigated for the first 5 years?
See charge item #5.
5. Are plans for managing and caretaking of this archive? for example:
 - a) Is there a clear archive owner with well-defined roles, responsibilities, authorities, & accountability?
 - b) Will data be protected from: unauthorized future modifications (level of change authority and read/write access); inappropriate disclosure of proprietary information (e.g., vendor quotes, cost estimates of future procurements, etc.); and malicious computer attacks.
 - c) Are PPPL's internal archiving and records management procedures being followed?
 - d) Is the schedule for QA audits of implemented procedures adequate?

The NCSX Documentation Archiving Plan has distributed responsibilities which increases the risks to the project. Recommendations related to these questions are further discussed below under the heading "Caretaking".

6. Is the NCSX Documentation Archiving Plan complete and address all the issues above? Should the Archiving Plan be reviewed/revised after 5 years to support a graded approach for longer term archive period up to 15 years?

The NCSX Documentation Archiving Plan should be reviewed. Issues identified include, in addition to the Caretaking issue identified below:

- a. *Data definition issues*
 - ♣ *Procurement keeps contractual data only. This data is kept for a time period of 6 years and 3 months.*

Any technical data is the responsibility of the project. This should be clarified in the plan. Should some of the data currently stored by Procurement be of value after the 6 years and 3 months time frame, NCSX should discuss this with Procurement.

- ♣ There is no value in archiving Job Hazard Analysis (JHA) forms since these are only important for field work.*
- ♣ NCSX NCRs are archived electronically via the project website. The QA NCR database is not an archival mechanism and should be removed from this Plan.*
- ♣ The review team was told that hard copy legacy drawings do not exist and have been replaced with pdf files. Therefore this item should be removed from the plan.*

- b. The NCSX Archiving Requirements have been revised to indicate that all electronic files must be readable for five years. From five to ten years, all files must exist with no guarantee of readability. The exact starting date for the five year period needs to be established.*
- c. At the start of the fifth year, the caretaker should review the appropriateness of the NCSX Archival Plan and associated systems for the remaining ten years.*
- d. The review team also recommends that an appendix to the plan specify the organizations responsible for each software package, e.g., IT for Microsoft Office.*
- e. The role of Quality Assurance should be defined as performing periodic audits of the effectiveness of and compliance to this plan. The first audit should be done after the first year to review the process and results of the Caretaker's annual review. Thereafter, the audits should be scheduled at a frequency dependent upon the number and significance of problems identified, if any.*

Caretaking

The primary concern of the review team involves the caretaking role and responsibilities. Specifically:

1. The caretaking roles are distributed with no single individual maintaining overall responsibility. As individuals become more involved with future projects, it would be easy for these caretaking responsibilities to be overlooked. Therefore, the review team

- recommends that a single individual be assigned primary responsibility for overseeing the NCSX Archives. This individual will ensure that the distributed caretakers assigned to specific sections of the archive fulfill their responsibilities.
2. In order to maintain focus on this effort, it is recommended that a specific cost center be created for this work. The amount of money placed in this cost center may vary. If no problems are encountered, it will be a low level amount that would allow the overseer to remain confident that the data is properly protected and accessible via the appropriate software.
 3. The overseer should be responsible for managing the program including the integrity of the data, changes to the data, maintenance of the systems and data, and identification and resolution of problems.
 4. The overseer should be charged with performing an annual review of the data, both electronic and paper/films. Additional reviews would be warranted when significant changes in the supporting software or hardware are planned. It is suggested that the review include a random check of the ability to open files and a random check that files exist. A crude way of performing the later function is to have a record of the number of files contained in each folder and, for randomly selected folders, verify that this number has not changed. Each review should be documented. The report should indicate which files were accessed, the results of the test, descriptions of any problems encountered, and what steps are planned to be or were taken to resolve these problems. The resolution of these problems might involve other Laboratory resources including both people and money. Management support will be needed to assure that these resources can be provided.

Additional Observations:

The review team was told that H. M. Fan encountered problems when trying to use an older ANSYS data file. However, he was away and could not be interviewed. The project should talk with him to find out more about these problems and their potential future significance.

The NCSX Documents and Records Plan, NCSX-PLAN-DOC-004, dated 10/26/06, contains the table below used to determine the retention requirements for project records. These requirements assume a project that becomes operational and is then decommissioned. The project should review the retention requirements in this document to determine which are appropriate and whether additional retention requirements exist for canceled projects. GEN-023, Records Management, provides further guidance.

From NCSX-PLAN-DOC-004:

Type of Record	NCSX Record Key	DOE Record Retention Schedule (GEN-023)	Retention Requirement (GEN-023)
Initial planning documents	DC1	14	Until construction project completion
NEPA documentation and other records	DC2	E	25 years – need DOE approval to dispose of
Other technical information and/or data prepared for outside (of DOE) agencies	DC3	O	10 years – need DOE approval to dispose of
Design requirements/design, criteria, and operations documentation records that demonstrate the capability for safe design, fabrication, modifications, and operations. Includes both in-house manufacturing and supplier manufacturing records.	DC4	14	Until dismantlement or disposal
Project decommissioning and dismantlement records	DC5	E	75 years after decommissioning and dismantlement
Project management records	DC6	A16	1 year after end of NCSX experimental operations
Miscellaneous records supporting, but not required for project record purposes	DC7	14	Until construction project completion or superseded

Table 4-1 Document Retention Requirements