

C-AD Electrical Equipment Inspection (EEI) Plan

Plan Owner: Jon Sandberg, C-AD Chief Electrical Engineer

ATS Number: 3499.3.32

Revision 0

March 14, 2007

- 1) There are presently eight qualified EEI inspectors at C-AD. An additional nine will be qualified by March 30, 2007.
- 2) C-AD Group leaders have been asked to estimate the amount of equipment that they control and that must be inspected. This estimate is divided into items that must be inspected (parents) and identical items that must be labeled (clones). This estimate is ongoing and will be refined in six months. The estimate at the present time is that there are 3000 parents and 25,000 clones remaining to be inspected, labeled and put in the database tracking system.
- 3) A standard inspection form has been developed on the basis of a check-off inspection-list approved by the Laboratory Electrical Safety Committee.
- 4) Qualified EEI inspectors fill out the forms during inspections and return them to a member of the C-AD ESSHQ Division. The data is then put into an Access database.
- 5) The data entered into the Access database is validated and then up-loaded into a Sybase database located on a server maintained by the C-AD Controls Group. An example page of the database is attached.
- 6) The Sybase database is regularly backed up. New data is uploaded by one person; all others presently have read-only privileges. The database exists behind the C-AD firewall.
- 7) There are approximately 2,600 entries in this database today.
- 8) Group supervisors will be surveyed to determine the priority to be given each piece of equipment. A running list of priority equipment to be inspected will be maintained and assigned to the EEI inspectors by March 30, 2007.
- 9) When inspections are complete bar codes stickers will be applied to the appropriate equipment by the EEI inspectors. Group supervisors in charge of the

equipment will be allowed to have technicians put stickers on clones of the inspected equipment.

10) It is anticipated each inspector will average 2 inspections per week. Given 17 inspectors this will result in 34 parent-inspections per week or 1,760 per year. It is then estimated that the inspection process for existing equipment will be completed within 2 years.

C-AD Plan to Review and Approve Legacy non-NRTL Listed Equipment by the AHJ

Friday, January 14, 2005

ATS # 2546

Legacy equipment not listed by a nationally recognized testing laboratory (NRTL) will not be retrofitted; rather it will be reviewed and approved for use according to BNL requirements in SBMS. The C-AD plan to implement the requirements to approve unlisted equipment is as follows:

1. Five persons in the C-AD Department will be trained as a local Authority-Having Jurisdiction (AHJ) by June 30, 2005 in order to start the review and approve unlisted equipment. (Responsible Person: Jon Sandberg)
2. Newly purchased equipment will be NRTL approved if available. This requirement will be effective on June 30, 2005. (Responsible Person: Jon Sandberg)
3. All unlisted equipment at C-AD will be reviewed by June 30, 2009. (Responsible Person: Jon Sandberg)
 - a. The risk system for prioritizing review and approval of legacy unlisted equipment is as follows. In this context, priority is the order in which equipment approvals will be done:
 - i. High priority equipment is unlisted equipment that has a recent history involving a severe electrical shock or flash burn (severe means partial or permanent disability or death), or equipment not constructed to nationally recognized standards in which the likelihood for a severe injury is probable due to frequent or multiple exposures to the equipment (once a week or more frequently), or equipment for which there is a recent history of DOE reportable occurrences. We will assess this type of unlisted equipment first.
 - ii. Medium priority equipment is unlisted equipment constructed and tested to nationally recognized standards that has the potential to cause severe injury but an injury is not likely and unlisted equipment that has the potential to cause severe injury but an injury is not likely due to infrequent exposure to the equipment (less than once a week). We will assess this type of unlisted equipment next.
 - iii. Low priority equipment is all remaining unlisted equipment, and it will be assessed last.
4. A complete table of unlisted equipment used at C-AD and the approval priority will be done by June 30, 2007. (Responsible Person: Tom Nehring)
 - a. To date, the majority of the equipment is functioning properly and being maintained to assure their proper operation. Table 1 is an example of our planned unlisted equipment list.
5. At C-AD, the AHJ's 'Approval for Use' mark will be as follows. (Responsible Person: Jon Sandberg, June 30, 2005)¹
 - a. Manufactured equipment – a standard mark that is unique to the AHJ and is either stenciled or inked onto the equipment. The mark shall be applied on at

¹ NOTE: Marking equipment with tags in an industrial environment has proven problematic at C-AD. Tags fall off or are damaged such that they cannot be read. Current practice with shielding is to use a standard stencil and to paint a mark, a mark which has proven to last for decades.

least two sides of the equipment. Records of the model number or electrical rating, testing if applicable and the manufacturer of the equipment shall be kept on file by the AHJ, along with the associated BNL AHJ Approval for Use Form.

- b. Equipment built locally or at a university or similar facility - a standard mark that is unique to the AHJ and is either stenciled or inked onto the equipment. The mark shall be applied on at least two sides of the equipment. A photograph of the equipment and the electrical rating shall be kept on file by the AHJ, along with the associated BNL AHJ Approval for Use Form.
- c. Exception to marks – if the equipment is manufactured or re-manufactured to nationally recognized standards by companies like General Electric, Westinghouse, Square D, Federal Pacific, NWL, or Franklin Electric, then marks are not required. However, records of the model number or electrical rating, testing if applicable and the manufacturer of the equipment shall be kept on file by the AHJ, along with the associated BNL AHJ Approval for Use Form.

TABLE 1
EXAMPLE PRIORITY TABLE FOR APPROVAL OF UNLISTED EQUIPMENT

Equipment	Manufacturer and Model Number or Manufacturer and Electrical Rating (Number of Identical Items)	Priority	Reason
RF Power Supplies	NWL 12 kV DC Anode power supply (11)	High	Frequent exposure. Recent DOE Occurrence.
15 kV Pad Mounted Switches	Cooper Industries 400 amps, 15.5 kV rms, 60 HZ (5)	Medium	Infrequent exposure.
480 V Switchgear	Satin 480 V, 4000 A, 65 kA sc	Medium	Constructed to industry standards
480 V drawout power circuit breakers	Westinghouse DB-50, 480 V, various ampere ratings (50)	Medium	Constructed to industry standards