

<b>SUBJECT:</b>	Fermilab Assessment Manual – Chapter 4 Independent Assessment Procedure – Form 1	<b>NUMBER:</b>	3902.1004 FORM 1
<b>RESPONSIBILITY:</b>	Quality Assurance Manager	<b>REVISION:</b>	000 C1
<b>APPROVED BY:</b>	Head, Office of Quality and Best Practices	<b>EFFECTIVE:</b>	

### FERMILAB INDEPENDENT ASSESSMENT REPORT FORM

<b>Fermilab Independent Assessment Report</b>	
<b>Assessment Number &amp; Title:</b> 10-IA-QA-0067 AD-Power Outage Recovery	<b>Version:</b> 14
<b>Date(s) of Assessment:</b> 6/22/10 – 09/23/10	
<b>Performing Organization:</b> Office of Quality & Best Practices	
<b>Assessed Organization(s):</b> Accelerator Division(AD): Operation Department, Main Control Room (MCR) Operation, Mechanical Support Department - Vacuum Group, Fluid System, Cryogenic Department - Operation Group, Central Helium Liquefaction (CHL) Controls Department -Timing and Links Engineering, System Services, Network Group, Proton Source Department –Preaccelerator (Preacc) and Linear Accelerator (Linac) Systems. Facility Engineering Services Section (FESS): Electrical Engineering , Operation Maintenance - Electrical Mechanical	
<b>Report content</b>  This report contains the following sections: <ul style="list-style-type: none"> <li>• Assessment Activities &amp; Scope</li> <li>• Scope Limitations</li> <li>• Activities Reviewed Within this Assessment</li> <li>• Description of the Implementation &amp; Effectiveness of Observed Activities</li> <li>• Conclusions</li> <li>• Findings</li> <li>• Observations, &amp; Recommendations</li> <li>• Commendable Practices</li> </ul> <p><b>Assessment Activities &amp; Scope:</b></p> <p>The implementation &amp; effectiveness of controls for an unscheduled power outage recovery was assessed. Technical and administrative activities were examined via interview, document review and observation relative to selected requirements of Integrated Quality Assurance (IQA).</p> <p><b>Scope Limitations:</b></p> <p>The scope of this assessment was limited to those activities or services associated with operations by Fermilab’s AD and FESS organizations to recover the accelerator complex from an unscheduled power outage. This assessment only focused on diagnosis and recovery of Electrical Power, Network, Cooling Systems, Vacuum, Cryogenics and Controls systems. During the assessment, the process owner and lead assessor agreed to add the MCR to the scope.</p> <p><b>Activities Reviewed Within this Assessment:</b></p> <ul style="list-style-type: none"> <li>• FESS High Voltage Power (HVP) shut down and switch over process</li> <li>• FESS (HVP) main power stations and power grid operations</li> <li>• Maintenance and use of call lists, check lists and procedures</li> </ul>	

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- Response to alarms and other indicators initiated from different systems
- Initiation and coordination of power restoration
- Initiation and coordination of system restorations
- Troubleshooting and monitoring of systems after power recovery

**Description of Implementation & Effectiveness of Observed Activities:**

Program:

The requirements for the quality program specified in IQA chapter one are met and are effectively implemented within the AD and FESS groups assessed except for one concern described in the following paragraph. Organizations are well defined. A current AD organization chart is attached (File 01).

Individuals interviewed demonstrated a clear understanding of their roles and responsibilities during a power outage. AD’s Operations Department Head or an authorized designee directs the lab-wide effort to restore systems. Specialized groups coordinate directly with their own members in the MCR or with MCR Operators. The following concern was voiced:

Although it is well understood by the AD and FESS groups interviewed, that the MCR assumes ultimate authority during a power outage, there is no current document communicating that authority throughout Fermilab. Staff interviewed indicated that in at least one instance, an individual without this knowledge inadvertently attempted to restore power in a manner detrimental to the recovery of the accelerator complex. That individual was not a member of the AD or FESS organizations.

FESS is responsible for HVP recovery and troubleshooting as well as communications between AD and the Commonwealth Edison (ComEd) company.

The MCR operators’ organization consists of; Operator I, Operator II, Senior Operator, Crew Chief, and Operation Specialist. Operation Specialists have extensive knowledge in different systems. Each level of MCR Operator’s roles and responsibilities are defined by their level of training and experience. The line manager for each system (e.g. Vacuum, Cryogenics, Network, etc) coordinates and synchronizes their efforts within their teams and with others. Backup personnel with similar expertise are available for each system recovery activity. Personnel from different departments assist each other as needed.

Personnel Training & Qualification:

IQA chapter two requirements for personnel training and qualification are met and are effectively implemented in both AD and FESS groups assessed although an exception is noted under work processes. An effective system of training was observed and a common understanding of requirements was demonstrated across the assessed groups within AD and FESS. Required training is identified in Individual Training Needs Assessment (ITNA) and recorded in the ES&H TRAIN database (File 02). It was observed that personnel operate complicated and specialized equipment. Training for this equipment is largely completed as hands-on training typically mentored by senior employees until trainees are deemed qualified. Persons interviewed indicated that more cross-training is desirable but not always possible.

After mastering the documented knowledge-base system “Rookie Books”, MCR Operators advance from one level to the next through systematic on-the-job training (OJT), testing and practical knowledge evaluations. This was confirmed by interviews and by inspection of OJT records. Operators and Crew Chiefs are on different rotating schedules so that Crew Chiefs work with all operators. OJT records are retained and the operators’ progress is monitored for advancement. Passing tests is required for advancement to the next level.

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“Rookie Books” and OJT checklists are revised as systems change. Personnel outside the MCR described informal OJT activities, but no formal OJT program was observed in those areas although it is not currently required until Fermilab’s ITNA system is updated.

Documents and Records:

FESS HVP documents reviewed were compliant with IQA chapter 4 “Documents & Records” requirements for document control and effectively implemented, however there was no awareness or evidence of implementation of Fermilab records management requirements.

The level of compliance and awareness of document and record control varies in effectiveness from group to group within AD and records management is not yet fully implemented. Not all AD documents reviewed were compliant with IQA or AD requirements. The implementation of document control throughout AD is governed by ADAP-01-0001 “Accelerator Division Procedure Requirements” dated 03/28/2008. ADAP-01-0001 specifies document control in three series (File 03). These are: ADAP for all documented procedures, ADSP for ES&H procedures and ADDP for department specific procedures. The assessment team reviewed electronic and printed documents and records including; procedures, drawings, flowcharts, checklists, logs etc. related to power outage recovery activities.

“Power Outage Response” (POR) documents dated between February 2009 and April 2009 are maintained and used by MCR staff. They describe response activities for the various systems including: Antiproton Source, Booster, Controls, Cryogenics, Linac, Main Injector, MI LCW, Recycler, Tevatron, and Tevatron Sump Pits. Although these documents contain high level procedures they also contain contact names but lack specified intervals for reviews and updates. Electronic versions of MCR documents are the controlled versions during normal operations but printed copies are made available during power outages according to several persons interviewed. AD’s Operations Department Head or an authorized designee may instruct MCR staff who to contact rather than relying solely on these documents.

Examples of revision control discrepancies between contacts listed on PORs and the corresponding groups on the “Power Outage Call-in List” include:

1. At least 14 contacts listed in 10 (POR) documents reviewed (File 04), were not found in the “Power Outage Call-in list” (File 05), including one name in the “always call” section for the Anti-Proton Source POR.
2. At least 12 contacts listed in the “Power Outage Call-in List” dated February 15, 2009 printed on 6/6/2009 are not found in the corresponding POR document.
3. A markup to the printed “Power Outage Call-in List” was not reflected in the POR for the Anti-Proton Source section. No markups and additions on the printed version were reflected in the on-line version (also File 05) of the same document with the same date, and the last two printed pages were not found on-line.

Events and activities are recorded in various electronic log files (elog). Each system generates its own elog files. The MCR has the primary elog, power outage recovery notwithstanding. During a power outage MCR logs are hand written and transferred to elog when power is restored.

According to interviewees, Mechanical group members are instructed to obtain ME procedures from the following web site: [http://www-admscad.fnal.gov/MSDMain/BDDP/CADLOC\\_BDDP.htm](http://www-admscad.fnal.gov/MSDMain/BDDP/CADLOC_BDDP.htm).

Paper copies of ADDP-ME procedures under revision by document owners and the department manager were observed. Three were inspected and compared to their on-line versions, with the following results:

1. On-line document ADDP-ME-000107 Turbo Station Test Procedure has a date of May 1994, past

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the 5 year review interval. (File 06).

2. The webpage (as of 9/16/2010) also indicated that the following procedures were obsolete in 2009: ADDP-ME-000118 Electrical and Leak Check Procedure for Pneumatic Valves and ADDP-ME-000122 Tev Quad Hipot Form (File 07). They were replaced with a document stating: “This Document Was Declared Obsolete During the Year 2009 Documents Review Cycle.” The manager explained that those procedures had been removed because they were beyond the 5 year review interval, and were in review by him to determine if he concurs with the decision to obsolete, although he was not aware of this reason until others were consulted.
3. Of 9 additional on-line procedures inspected, 5 more (ADDP-ME-000119 through ADDP-ME-000121, ADDP-ME-000123 and ADDP-ME-000124) were obsolete (same content as File 07) and 4 (ADDP-ME-000100 through ADDP-ME-000102 [see next paragraph], and ADDP-ME-000125) were dated between April 1991 and July 1993. (File 08)
4. The file naming convention “ADDP-ME-000xxx” is not consistently translated inside documents in 5 of 7 total non-obsolete ME procedures inspected. ADDP-ME-000102 is named ADDP-ME-0300 within the document while others used truncated names inside such as ME-000103 and ADDP 000128 in which the numerical portion matched the file name. (File 09)

Within the Cryogenic Department the Central Helium Liquefaction (CHL) group, including staff and shift crew members, use hard copy procedures in binders during power outages. The group leader maintains the original and revised procedures in two controlled binders. The original copy with signature sheets stays with the group leader and shift crew keep the other copy at the Chiller Control Room for use. CHL procedures reviewed, for example ADDP-CH-0016 Rev 2 “Utility Air Compressor LockOut/Tagout” procedure dated 4/24/2009, (File 10) were compliant with ADAP-01-0001, but one exception was found. The CHL group maintains and posts its contact list and crew rotation for MCR Operators and CHL staff at least monthly. Both groups corroborated this.

The Cryogenics “CHL coldbox trip response” (Crash Diagram flowchart), posted in the Chiller Control Room contains hand written markups. These markups are not reflected in the controlled electronic version. (File 11).

The Controls and Network group procedure for power outage called “Notes.POWER” (File 12) although not fully compliant with ADAP document requirements (example, document numbering convention, signatures) is contained in an online system manual available from the Accelerator Controls Network (ACNET) CVS repository, the official revision control system for the AD control system. One assessment team member, an IEEE software configuration standards expert, indicated that CVS systems are deemed to be an acceptable software engineering industry alternative to paper-based revision control systems. The CVS log indicated that the procedure dated 09/10/2010 was current.

The on-line Call-in list located at <http://www-bd.fnal.gov/cgi-mcr/callin.pl> was also reviewed. Most individuals interviewed outside of the MCR, including Controls and Networking personnel, use this list during system recovery. No issues were identified.

#### Work Processes:

Both AD and FESS are compliant with the requirements for work process control described in IQA chapter five. Controls are effectively implemented in both groups although one exception regarding inadequate controls in AD for maintenance of a Pelletron tank was identified.

Power and systems recovery is coordinated among various specialized groups in a systematic and effective

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manner by the AD Operations Department from the Main Control Room (MCR). The Operations Department Head or an authorized designee directs the effort. It is well understood within AD and FESS departments assessed that the MCR instructs each group when to initiate activities under their control to minimize the amount of downtime. An unscheduled power outage of sufficient extent and duration results in phone calls and pages from the MCR to key personnel or backups who may or may not be on site. In all of the groups assessed employee vacation/leave schedules are coordinated to ensure that at least one key person or their backup is available at all times. Management and some troubleshooting may be done remotely.

MCR staff maintains a POR document describing how each specialized group responds to an unscheduled power outage. Controlled binders contain hard copies of these electronic documents for use by MCR staff during power outages. In addition to these documents different procedures exist for a number of other work groups. These documents are used for troubleshooting, maintenance or repair work.

Maintenance and testing is done during scheduled shutdowns however during an unscheduled power outage troubleshooting and recovery is the primary objective. Regular monitoring and reporting identifies equipment failures or system degradations. Faulty equipment may be repaired or replaced with a spare depending on the severity of the fault and expected duration of the shutdown. Spare equipment was observed in various control environments such as in locked lockers, locked closets and locked caged areas.

An exception to compliance with work process controls was identified on July 24, 2010 in AD when an unscheduled power outage caused two Mechanical Support workers to become trapped on a motorized service platform inside the Pelletron tank located in building MI35. The Pelletron tank is classified as a confined space during normal operation but was declared a “Non-Permit Confined Space” during maintenance per ADDP000128 Pelletron Open/Close Procedure (Same as Engineering Specification 1350-ES-296128-D1). (File 13)

Less than adequate controls identified during interviews and document reviews include:

- Inadequate hazard analysis (no JHA, and not addressed in procedure ADDP000128)
- Inadequate communication (no outside communication from within the Pelletron)
- Inadequate training of Pelletron workers and other on-site employees
- The Pelletron is not listed in the ES&H’s Confined Space (File 14) database but appears to meet the definition found in FESHM 5063 Confined Spaces. (File 15)

#### Background

Although the trapped workers’ supervisor was aware that they were in the Pelletron he was not on site and interviewees indicated that nobody on site was aware. The workers had no safe egress but they happened to be high enough to lift a cell phone above the metal walls to call the MCR for help. Emergency extension 3131 was not called. When other on-site personnel arrived to help, neither they nor the trapped workers knew how to manually operate the service platform, or how to turn it back on after power was restored. A Pelletron expert arrived on site and was able to free the workers within roughly 30 minutes according to managers interviewed.

Management indicated that they had implemented remedial and corrective actions to prevent recurrence and documented a lessons learned report. AD’s Senior Safety Officer (SSO) entered the report into the Fermilab Lessons Learned Database <https://www-esh.fnal.gov/pls/cert/lessons.print?id=301>. No entry was made into the frESHTRAK database. The assessment team leader notified the ES&H Section Director about the incident.

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Inspection And Acceptance Testing:

Although applicability of this criterion to power recovery is limited, the requirements of IQA chapter eight are met to an appropriate degree in the assessed FESS and AD organizations.

All groups assessed indicated that they perform visual inspections and if necessary testing of faulty systems, equipment or replacement parts associated with power outage and recovery. The degree of inspection, test and maintenance depends on the duration and extent of an outage. FESS staff purchase parts from a list of approved sources, and use contractors for maintenance, inspection and test of equipment such as transformers. AD Network & Controls use excess equipment from Fermilab computing farms which is tested when installed as replacements. They also use networking equipment that is provided and maintained by Cisco Systems, Inc. If a defective device is identified by Proton Source or Mechanical Support it is repaired or replaced. After removal a device may be repaired, inspected or tested as time allows. Spares of commercially purchased equipment, equipment built in-house and repaired equipment was observed in protected storage in Proton Source.

**Conclusions:**

This event-based assessment covered 12 groups in AD and 1 in FESS. The twenty-one individuals interviewed demonstrated a clear understanding of their roles and responsibilities during a power outage. Although the overall level of compliance to IQA requirements was high and effective, there were some instances of noncompliance.

Personnel are qualified based on credentials, experience, and knowledge. They also receive hands-on training on specialized Fermilab activities they might perform during recovery from a power outage, troubleshooting and running their systems. MCR operators receive formal progressive OJT.

FESS HVP documents are controlled. AD maintains a procedure for document control but not all documents fully comply with it. MCR and most of the systems use elogs to communicate and document their daily records and employ printed copies of electronic procedures for troubleshooting and maintenance during a power outage. Records management requirements are not fully implemented in FESS or AD.

Groups within the scope of this assessment employ an effective system of work process controls to ensure that operations are carried out in a controlled manner, although one exception was identified.

**Findings:**

1. Documents are not controlled in accordance with IQA Chapter 4 requirements.

IQA Chapter 4 section 4.2 states "...Management is responsible for providing the resources necessary to fulfill the document control and records management requirements. Fermilab employees, users, and contractors are required to comply with the document control and records management policies and procedures in place at Fermilab."

A comparison of the MCR "Power Outage Call-in List" and Power Outage Recovery documents identified the following revision control non-compliance:

- At least 14 contacts listed in 10 (POR) documents reviewed (File 04), were not found in the

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“Power Outage Call-in list” (File 05), including one name in the “always call” section for the Anti-Proton Source POR.

- At least 12 contacts listed on the “Power Outage Call-in List” dated February 15, 2009 printed on 6/6/2009 are not found in the corresponding POR document.
- A markup to the printed “Power Outage Call-in List” was not reflected in the POR for the Anti-Proton Source section. No markups and additions on the printed version were reflected in the on-line version (also File 05) with the same date, and the last two printed pages were not found on-line.

ADAP-01-001Rev.4 dated 3/31/08 (File 03) provides further requirements for all AD procedures. Section 3.13 states “Quinquennial Review Of Procedures: Each procedure issued under the AD procedure system must be reviewed to determine its continued validity at intervals not to exceed five years....The start of the five year interval is the issue date for the effective revision of the procedure”.

- Five on-line documents ADDP-ME-000107 Turbo Station Test Procedure (File 06) and ADDP-ME-000100 through ADDP-ME-000102, and ADDP-ME-000125 were dated between April 1991 and May 1994 (File 08), past the 5 year review interval.
- The file naming convention “ADDP-ME-000xxx” is not consistently translated inside documents in 5 of 7 non-obsolete ME procedures inspected. ADDP-ME-000102 is named ADDP-ME-0300 within the document while others used truncated names inside such as ME-000103 and ADDP 000128 in which only the numerical portion matched the file name. (File 09)

The Cryogenics “CHL coldbox trip response” (Crash Diagram flowchart), posted in the Chiller Control Room contains hand written markups. These markups are not reflected in the controlled electronic version. (File 11).

2. The Fermilab Records Management Program required by the IQA, Chapter 4 “Document & Records” section 4.4, “Records Management” states that “Fermilab’s policies and procedures for a centralized records management system are maintained by Records Management and are described in more detail in the Records Management Policy and Procedures”. This requirement is not yet fully implemented in AD and there is no awareness or evidence of implementation of Fermilab records management requirements in the assessed FESS HVP group.

This issue was addressed in Corrective Action Plans AD-05072009-04 and FE-03182009-05, both issued during the 2009 QA “As-Is” assessment. These CAPs need to be implemented and communicated to those affected.

3. Work process controls for Pelletron maintenance do not adequately implement IQA Chapter 5 and Chapter 2 requirements.

Work Processes: IQA Chapter 5, section 5.3 states: “...Line management is responsible for applying the graded approach to determine the appropriate level of work process controls ...”. The following less than adequate controls were identified during interviews and document reviews:

- The Job Hazard Analysis (JHA) process failed to address the risk of entrapment during a power outage associated with working inside the Pelletron tank. This location is designated as non-permit confined space work during maintenance.

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- There was no provision for workers inside the tank to communicate with personnel outside of it and management failed to ensure that on-site personnel were aware that workers were in this tank.
- The Pelletron Open/Close Procedure failed to address the risk associated with the lack of access to emergency controls from inside the Pelletron.
- Although the Pelletron is clearly labeled as a confined space, it is not listed in the ES&H’s Confined Space (File 12) database but appears to meet the definition found in FESHM 5063 Confined Spaces (File 13):

“Confined Space - A space that: 1. Is large enough and so configured that an employee can bodily enter and perform assigned work; and 2. Has limited or restricted means for entry or exit; and 3. Is not designed for continuous employee occupancy “Restricted entry or exit,” means physical impediment of the body, e.g., use of the hand or a contortion of the body to enter into, or exit from, the space”.

IQA Chapter 2 “Personnel Training & Qualification”, section 2.1 bullet three states: “. . . Project/task-specific training - imparts the knowledge required for personnel to perform their assigned duties safely and successfully. This training may include project/task goals and schedules, implementing procedures, safety and hazard controls, methods, requirements, process metrics, and skills. . . ”

When on-site personnel arrived to help workers trapped in the Pelletron, neither they nor the trapped workers knew how to manually operate the service platform, or how to turn it back on after power was restored.

### Observations and Recommendations

1. **Observation:** Although it is well understood by the AD and FESS groups interviewed, that the MCR assumes ultimate authority during a power outage, there is no current document communicating that authority throughout Fermilab. Staff interviewed indicated that in at least one instance, an individual without this knowledge inadvertently attempted to restore power in a manner detrimental to the recovery of the accelerator complex.  
**Recommendation:** AD should update an existing memorandum or create a new one for the laboratory Director to sign and distribute to appropriate personnel.
2. **Observation:** Groups assessed performed no simulated power outage drills.  
**Recommendation:** It could be beneficial to simulate unscheduled power outage responses for each system to ensure a state of readiness and to validate the activities and their sequence recorded in PORs.
3. **Observation:** Controls and Network group procedure “Notes.POWER” although not fully compliant with ADAP-01-0001 could be aligned to meet the intent of it.  
**Recommendation:** Revise ADAP-01-0001 to accommodate documents like “Notes.POWER” in systems like the ACNET CVS repository, or revise “Notes.POWER” and documents like it to fully comply, or provide some authorized deviation for documents like “Notes.POWER” contained in systems like ACNET CVS.

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- 4. Observation:** Seven on-line procedures including ADDP-ME-000118 Electrical and Leak Check Procedure for Pneumatic Valves and ADDP-ME-000122 Tev Quad Hipot Form (File 07) and ADDP-ME-000119 through ADDP-ME-000121 and ADDP-ME-000123, ADDP-ME-000124 (same content as File 07), were obsolete. They were replaced with a document containing the following wording, “This Document Was Declared Obsolete During the Year 2009 Documents Review Cycle.”
- Recommendation:** Replace this wording with a simple form that indicates; document name, date obsolete, by whom, and check box options indicating the reason why such as; to be replaced by ADDP-ME-000XXX, permanently retired, or temporarily withdrawn pending update, etc. This would allow any user to readily understand ownership and status with minimal effort for procedure owners and users.

**Commendable Practices:**

Planning, execution and record keeping of MCR operator on-the-job training (OJT) is commendable.

**Titles and Names of Persons Interviewed:**

J. Anderson	J. Makara
D. Augustine	B. Mau
S. Baginski	S. McCormick
M. Ball	J. Nguyen
D. Bollinger	J. Pathiyil
R. Crouch	R. Plumer
K. Dual	B. Slazyk
D. Finstrom	G. Vogel
M. Geynisman	T. Zingelman
L. Huitt	
P. Hurh	
P. Karns	

**Documents Reviewed:**

**FESS**

FESS HVP Group July Call List  
FESS HVP Group August Call List  
FESS HVP Group Incident Log-01  
FESS HVP Group Incident Log-02  
FESS HVP Group Work Permit and Notification Form  
FESS HVP Group Individuals Training  
FESS HVP Master Sub-Station Switching  
FESS HVP Kautz Road Sub-station Switching

**AD**

**Accelerator Division organizational charts**

**ADAP-01-0001 Accelerator Division Procedure Requirements**

Draft August 2010 Tevatron Cryogenics (Chl/Satellite Frig) Operations Cryogenic/Central Helium

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<p>Liquefier, Chl-I.A , Chl Power Outages  CHL July Cryo Calendar  CHL August Cryo Calendar  CHL Trip Response  CHL Personnel Requisition  CHL Trailer activity July 2010  Helium Report July 2010  Draft August 2010 Tevatron Cryogenics (Chl/Satellite Frig) Operations Summary  CRII CRYO E-Log -- CRII Mon Aug 2, 2010  ADDP-CH-4006 Notifications Accelerator Division Departmental Procedures, Cryogenics/Central Helium Liquefier/Cryo Operations,  CHL CRYO E-Log Mon Jul 19  FRIG SOP-3.1.0.6 Fermilab Master Substation Power Outages, (Typically feeder 24, 38, 43, 45, 46B)</p> <p>Chl-I.A-Chl Power Outages, Cryogenic/Central Helium Liquefier Chl Power Outages April 2000  July 2010 Tevatron Cryogenics (Chl/Satellite Frig) Operations Summary  Confined Spaces [FN000003/CR/00] Training Course  OSHA 1910.146  FESHM 5063 Confined Spaces  ES&amp;H Query results from Confined Spaces  TRAIN ITP for interviewed staff  ADDP-ME-000100 Recycling Spray Paint  ADDP-ME-000101 Procedure for Quality Assurance Signoff for Maintenance and Upgrade Tasks on the Accelerator complex  ADDP-ME-000103 Main Ring Magnet Change Procedures  ADDP-ME-000107 Turbo Station Test procedure  ADDP-CH-0016 House Utility Air Compressor Lockout/Tagout Procedure  ADDP-ME-000118 Electrical and Leak Check Procedure for Pneumatic Valves  ADDP-ME-000122 Tev Quad Hipot procedure  ADDP-ME-000125 Removal of Quads at C49 and D11  ADDP-ME-000128 Pelletron Open/Close Procedure  ADDP-ME-000300 Booster/8 GeV Ljne Access Hatch Removal Procedure  Accelerator downtime plot  Notes.POWERDOWN  Warning Sign Posted in MCR  Power Outage Response, Bob Mau/Aria Meyhoefer  Anti-Proton Source Power Outage Response  Booster Power Outage Response  Controls Power Outage Response  Cryogenic Power Outage Response  Linac Power Outage Response  Main Injector Power Outage Response  MI LCW Power Outage Response  Recycler Power Outage Response  Tevatron Power Outage Response  Tevatron Sump Pits Power Outage Response  Power Outage Call-in List</p>
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Preacc Power Outage Response  
FRIG SOP-3.1.4 Tevatron Cryo Power Reduction Plan.doc, Tevatron Cryogenic (Chl And Satellite)  
Power Reduction Plan Author: J. Makara, 2/19/2004 revised  
FRIG SOP-3.1.2 Kautz Road Substation Elec Diagram.doc

(See also “Attachments” section below)

**Standards, Regulations, and Other Program Requirements Applied:**

The specific criteria applied to this assessment were:

Fermilab Integrated Quality Assurance (IQA), Document 1001  
Chapter 1 – Program  
Chapter 2 – Personnel Training & Qualification  
Chapter 4 –Documentation and Records Management  
Chapter 5 – Work Processes  
Chapter 8 – Inspection And Acceptance Testing

**Describe or List Any Other Assessment Methods Used:** None

**Corrective Action Plans Issued:**

AD-20101028-01 Documents are not controlled in accordance with IQA Chapter 4 requirements..  
AD-20101028-02 Work process controls for Pelletron Maintenance do not adequately implement IQA Chapter 5 and Chapter 2 requirements.

**Assessors’ Names (asterisk indicates team leader):**

Jed Heyes\* - OQBP  
Bakul Banerjee – CD  
Tom Gehrke  
Susan Rahimpour - OQBP  
Jim Rife - TD

**Submitted by:** Jed Heyes **Date:** November 11, 2010

**Distribution (Distribute to assessed organizations’ management, OQBP head, and other interested parties):**

R. Dixon B. Mau J. Anderson D. Augustine S. Baginski M. Ball D. Bollinger R. Crouch D. Finstrom M. Geynisman	J. Grant J. Cotton T. Gehrke J. Heyes B. Banerjee S. Rahimpour J. Rife D. Rohde
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<b>SUBJECT:</b>	Fermilab Assessment Manual – Chapter 4 Independent Assessment Procedure – Form 1	<b>NUMBER:</b>	3902.1004 FORM 1
<b>RESPONSIBILITY:</b>	Quality Assurance Manager	<b>REVISION:</b>	000 C1
<b>APPROVED BY:</b>	Head, Office of Quality and Best Practices	<b>EFFECTIVE:</b>	

L. Huitt  
P. Hurh  
P. Karns  
J. Makara  
S. McCormick  
J. Nguyen  
J. Pathiyil  
R. Plumer  
B.Slazyk  
G.Vogel  
T.Zingelman  
R. Walton

**Attachments:**

File 01 – AD Organizational Charts  
File 02 – TRAIN ITP files  
File 03 – ADAP-01-0001 Accelerator Division Procedure Requirements  
File 04 – Power Outage Response Documents (Files 04a-04j)  
File 05 – Power Outage Call-in list  
File 06 – ADDP-ME-000107 Tevatron Turbo Station Test Procedure  
File 07 – ADDP-ME-000118 Electrical Leak Check and ADDP-ME-000122 Tev Quad HipotTest  
File 08 – ADDP-ME-000100-000101, 000125 and 000300 (file name 000102) dated 0491-0793  
File 09 – ADDP-ME-000xxx-filename\_v\_insidedoc  
File 10 – ADDP-CH-0016 Utility Air Compressor LockOut/Tagout  
File 11 – CHL coldbox trip response (See SOP CHL-111 D3)  
File 12 – Notes.POWER  
File 13 – ADDP000128 Pelletron Open/Close Procedure  
(Same as Engineering Specification 1350-ES-296128-D1)  
File 14 – Query result for Active and Inactive Confined Spaces (14a, 14b)  
File 14 – FESHM 5063 Confined Spaces