

Accelerator Readiness Review Plan

General Lines of Inquiries (LOIs)

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Required Documentation

Safety Assessment Document (SAD)

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| LOI |
| 1. Interview selected management /staff involved in SAD development |
| 2. Determine adequacy of safety analysis performed to support SAD |
| 3. Determine if SAD meets DOE O 420.2C requirements |
| 4. Determine if SAD provides adequate technical basis for ASE |
| 5. Determine adequacy of process to review and approve SAD |
| 6. Interview selected management /staff to determine knowledge of SAD requirements |
| 7. Determine adequacy of SAD to support commissioning |

Accelerator Safety Envelope (ASE)

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| LOI |
| 1. Interview selected management/staff involved in ASE preparation |
| 2. Determine if ASE addresses required controls and operating limits |
| 3. Determine if ASE meets DOE O 420.2C requirements |
| 4. Determine adequacy of process to review and approve ASE |
| 5. Interview selected management/operational staff |
| 6. Determine adequacy of ASE to support commissioning |

Unreviewed Safety Issues (USI)

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| LOI |
| 1. Determine if USI process meets DOE O 420.2C requirements |
| 2. Interview those involved in USI process development and management |
| 3. Determine if USI process will be adequately linked to Configuration Management program |
| 4. Determine adequacy of USI process to support commissioning |

Contractor Assurance System (CAS)

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| LOI |
| 1. Determine if CAS provides a comprehensive internal assessment process |
| 2. Determine if the CAS Program uses external assessment: employs peer reviews and assessments that include accelerator subject matter experts from other accelerator facilities |
| 3. Determine CAS program adequacy to support commissioning |

Safety Configuration Management (CM)

| LOI |
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| 1. Determine if the configuration of Credited Controls are properly managed during accelerator operation and maintenance |
| 2. Determine if the accelerator controls system is protected against un-authorized access |
| 3. Determine if configuration management is applied to defense-in-depth controls on a graded approach |
| 4. Determine if the configuration management program is adequate to support commissioning |

Accelerator Systems

Commissioning Plan & Fault Studies

| LOI |
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| 1. Commissioning Plan fully describes roles, responsibilities, accountabilities, and authorities that establish the expectations and duties of managers, supervisors, and operators for carrying out the commissioning/ operations and any related documented authorizations |
| 2. Commissioning Plan addresses staffing schedules, authority and reporting chain for operational, safety, and scheduling issues procedures (normal and emergency/contingency), administrative controls, and personnel training |
| 3. Commissioning Plan identifies or properly references engineered safety systems that will be operable for the accelerator |
| 4. Commissioning Plan identifies the operational characteristics for specific modes of commissioning needed to support the safety case for progressively higher power commissioning |
| 5. Determine adequacy of Commissioning Plan and fault studies to support commissioning |

Credited Controls (CC)

| LOI |
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| 1. Verify that Credited Passive, Active, and Administrative Controls in the ASE are installed and operational |
| 2. Verify that Credited Passive, Active, and Administrative Controls in the ASE are properly managed |
| 3. Verify that defense-in-depth controls also have Configuration Management applied on a graded approach |
| 4. Determine adequacy of Credited Controls to support commissioning |

Accelerator Operator Training and Qualification Program

| LOI |
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| 1. Review training program documentation and procedures |
| 2. Interview training manager regarding program |
| 3. Interview selected personnel regarding training |
| 4. Observe selected job assignments and compare with job-specific training |
| 5. Determine adequacy of training program to support commissioning |

Accelerator Commissioning Procedures

| LOI |
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| 1. Review procedure program documentation |
| 2. Interview staff responsible for assuring implementation of the procedure program |
| 3. Interview selected management/staff on their role in the procedure program |
| 4. Review selected operating procedures controlling approval for startup, beam authorization, and safety significant controls |
| 5. Review procedures required for commissioning readiness |
| 6. Interview staff on emergency response procedures |
| 7. Observe selected job assignments with job-specific procedures |
| 8. Determine adequacy of procedure program to support commissioning |

Work Planning and Control Related to Accelerator Safety

| LOI |
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| 1. Review work control program documentation |
| 2. Interview selected management/staff on their role in the work control program |
| 3. Observe selected job assignments with job-specific work controls |
| 4. Determine adequacy of work planning and control to support commissioning |

Cyber Security

| LOI |
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| 1 There is a plan that addresses cyber security on a site-wide basis and specifically for accelerator controls |
| 2 The cyber security risk assessment for accelerator controls adequately identifies threats and vulnerabilities specific to the operating environment |
| 3 The cyber-risk assessment for accelerator controls adequately identified risks and counter measures to reduce risks to an acceptance level |
| 4 There is an authority to operate the system used to control accelerator functions within acceptance risks |
| 5 The cyber-security plan incorporates the following recommended practices and protocols: <ul style="list-style-type: none"> a. defense-in-depth by layering b. physical security c. network segmentation and isolation d. Internal/ external fire-walling e. mitigation of insecure processes and protocols f. access control from on and off-site g. authentication management h. user auditing i. configuration management including patches j. monitoring and use analysis k. vulnerability scanning and periodic l. Incident Response/Contingency Planning m. Control of external media devices n. Remote access |
| 6 There are adequate personnel resources to maintain the cyber-security program and processes: <ul style="list-style-type: none"> a. personnel are trained and authorized |
| 7 There are adequate fiscal resources to maintain the cyber-security program equipment through near-term software and hardware upgrades |
| 8 There is adequate infrastructure to maintain and support cyber-security for accelerator controls |
| 9 Software QA supports activities related to commissioning |

Software QA

| LOI |
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| 1. The development of accelerator controls and safety system software is governed by applicable standards |
| 2. The applicable standards require, at a minimum: a) written requirements or specifications b) software version management c) documentation |
| 3. Accelerator controls and safety system software have accurate configuration information from users/system owners for device control and data translation |
| 4. There are resources that allow controls and safety system software to be tested before implementation. |
| 5. The interface for programmers needing information or analysis data is controlled |
| 6. Software users are adequately trained and authorized depending on the level of control afforded by accelerator and/or safety system software before being allowed access |
| 7. There is an adequate user feedback mechanism to resolve software issues |
| 8. Accelerator controls and safety system software are configuration managed |
| 9. There are adequate personnel resources to maintain the accelerator controls and safety system software applications; personnel are trained and authorized |
| 10. There is adequate infrastructure to maintain and support accelerator controls and safety system software applications |
| 11. Software QA supports activities related to commissioning |

Industrial Safety Systems

| LOI |
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| 1. Are the industrial hazards of the system well understood? |
| 2. Were the hazards of the system considered during the design phase? |
| 3. Does the system design, where possible, use engineered safeguards to minimize industrial hazards during operation? |
| 4. Is the system design documented? |
| 5. Does the system interface to other industrial systems and is that interface documented? |
| 6. Does the system interface to the PPS? |
| 7. Are the documents available to staff that work on the system? |
| 8. Was the system checked to ensure it performed according to design when it arrived at the lab (or at the point of assembly)? |
| 9. Are there further operational checks needed before it is placed in service? |
| 10. Are there system integration checks needed before the systems is placed in service? |
| 11. Are the hazards of working on (installing, trouble-shooting, repairing, maintaining) the installed system mitigated on the basis of a laboratory industrial safety program? |
| 12. Are the hazards of working on the system mitigated as part of an integrated laboratory work planning and control process? |
| 13. Is the staff that works on the system qualified and are they authorized to conduct work on the system? |
| 14. Are there lessons learned from previous operational experience with this system? Have they been implemented? |
| 15. Are industrial systems ready to support commissioning? |

General Radiological Protection Program

| LOI |
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| 1. Does BNL RPP reflect scope of accelerator radiological hazards for prompt ionizing radiation and activated materials? |
| 2. Does the BNL RPP utilize lessons learned from internal and external events? |
| 3. Is a hierarchy of controls effectively implemented including engineering and administrative controls? |
| 4. Is BNL RPP effectively integrated with accelerator operations and other safety and health disciplines? |
| 5. Is BNL RPP effectively integrated as part of the laboratory work planning and control process? |
| 6. Is BNL RPP effective in maintaining radiological exposures to personnel are maintained as low as reasonably achievable (ALARA)? |
| 7. Is the BNL RPP providing adequate support to upgrade activities? |
| 8. Determine adequacy of radiation protection program to support commissioning |

Emergency Management Program

| LOI |
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| 1. Site has an emergency management program (EMP) supported by documentation and procedures |
| 2. EMP includes a technical basis document and an emergency management program plan |
| 3. EMP includes procedures relevant to accelerator operations |
| 4. EMP addresses onsite and offsite hazards (if applicable) and associated impacts for both normal operations and credible accidents |
| 5. BNL EMP benefits from programmatic lessons learned |
| 6. BNL effectively utilizes mutual aid relationships |
| 7. Accelerator Operations personnel have an effective understanding of EM |
| 8. Accelerator Operations personnel have an effective understanding of the application of programmatic lessons learned |
| 9. Observe function of site-wide notification system |
| 10. Determine adequacy of emergency response program to support commissioning |

Lessons Learned Program

| LOI |
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| 1. Review lessons learned program procedures and documents to verify coordinated site-wide program |
| 2. Verify that the program identifies routine and non-routine occurrences that elevate to the level of lessons learned |
| 3. Verify that the program identifies and evaluates lessons learned at other DOE and non-DOE facilities |
| 4. Verify that there is a program to effectively disseminate lessons learned to those best suited to use the information |
| 5. Verify that recent external accelerator-based lessons learned have been effectively evaluated and incorporated into current Accelerator Readiness Review |
| 6. Lessons learned processes effectively support commissioning |

Records Management

| LOI |
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| Key records are identified |
| Records custodians for key records are identified |
| Records are managed and stored properly |
| Record management effectively support commissioning |

Conduct of Operations

| LOI |
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| 1. Interview management and staff involved in the development and implementation of the Conduct of Operations program |
| 2. Review Conduct of Operations procedures to determine overall adequacy of program |
| 3. Determine if Conduct of Operations program is adequately implemented |
| 4. Interview staff to assess knowledge of and implementation of Conduct of Operations program |
| 5. Determine adequacy of the Conduct of Operations program to support commissioning |