# BROOKHAVEN NATIONAL LABORATORY
## SBMS Interim Procedure

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**Interim Procedure Number: 2004-18001-004 Revision: 4 on 7-8-04**

**Title: Change Management Checklist**

**Point of Contact: Pat Williams**

**Management System: Occupational Safety and Health**

**Effective Date: April 30, 2004 Expiration Date: December 31, 2005**

**Approved by (line management, Management System Steward): Jim Tarpinian**

**Approved by (Deputy Director, Operations): Michael J. Bebon**

**Applicability: Plant Engineering Division, Central Fabrication Services Division and Collider-Accelerator Department**

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## 1. Purpose

1.1. This checklist is to review facility changes against SBSM requirements and external industry standards.

## 2. Definitions

2.1. Refer to the Definitions contained in OHSAS 18001 Clause 3.

## 3. Responsibilities

3.1. The OSH Management System Representative shall ensure the change management checklist is used before changes take place.

## 4. Scope

The checklist consists of key questions that might trigger safety or environmental requirements.

## 5. Procedure

5.1. The OSH Management System Representative shall ensure that facilities or experiments undergoing change shall be reviewed against current requirements. The following checklist or its equivalent shall be used.

5.2. This checklist is available on the SBMS web at http://www.bnl.gov/sbms_office/hid/ or at the C-AD web at http://www.rhichome.bnl.gov/AGS/Accel/SND/C-AHazardTool/screen.html

5.2.1. The C-AD OSH Management System Representative shall require the project leaders to submit the checklist or its equivalent to the C-AD Accelerator Systems Safety Review Committee during the design phase of an accelerator modification. See C-AD OPM 9.3.1, Procedure for Reviewing Conventional Safety Aspects of a C-A System.

5.2.2. The C-AD OSH Management System Representative shall require the liaison physicists and liaison engineers to submit the checklist or its equivalent to the C-AD Experimental Safety Review Committee during the design phase of an experiment. See C-AD OPM 9.2.1, Procedure for Reviewing Environmental, Health and Safety Aspects of an Experiment.

5.2.3. F&O requires that for all its projects (appropriate work order estimates, construction and demolition projects and O&M maintenance contracts or projects) Plant Engineering conduct a review to identify safety and health concerns during the conceptual design or early planning phase. These reviews include Central Fabrication Services facility projects. See Plant Engineering procedure EP-ES&H-500 Project Environmental, Security, Safety and Health Review. EP-ES&H-500A ES&H Evaluation 500A Form is used in lieu of the checklist included in this procedure.

5.3. The OSH Management System Representative shall ensure procedures are in place such that individuals are assigned to do a review against current legal and other requirements to ensure that all tasks are properly identified and compliance is maintained.

5.4. The OSH Management System Representative shall ensure the results of the change management process are documented.

5.4.1. For C-AD, committee minutes, attachments, and all reports associated with a project or experiment safety review are to be kept with the C-A ESHQ Division for archival storage.

5.4.2. For F&O Directorate, Plant Engineering maintains files for each of projects in Engineering and Construction Services or Maintenance Management, depending on the nature of the project. These files include are reviews, change notices and approvals associated with the project.

## 6. Example Checklist

Operation Title: _____

Point of Contact: _____

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| **1.** | [ ] yes [ ] no | Are there any chemicals, toxic materials, or hazardous material handled, generated, used, or stored in this operation, including oils and solvents? | |
| | **1a.** | [ ] yes [ ] no | Does this operation use or transport any chemicals with a Threshold Limit Value, or chemical which is regulated by OSHA? |
| | **1b.** | [ ] yes [ ] no | Are any chemicals or chemical wastes used, stored or generated in this operation either known or suspected human carcinogen? |
| | **1c** | [ ] yes [ ] no | Does this operation involve the use, storage or generation of peroxide forming chemicals, shock sensitive chemicals or picric acid? |
| | **1d.** | [ ] yes [ ] no | Does this operation use, generate or store flammable or combustible gases, liquids or solids, including solvents? |
| | **1d(1).** | [ ] yes [ ] no | Does this operation involve the use of hydrogen gas? |
| | **1e.** | [ ] yes [ ] no | Does this operation involve the use, storage or generation of caustic/corrosive chemicals or wastes? |
| | **1f.** | [ ] yes [ ] no | Will this operation involve the use of beryllium - other than articles made of beryllium or that contain beryllium? |
| | **1g.** | [ ] yes [ ] no | Will this operation involve more than 30 minutes handling time with lead? |
| | **1h.** | [ ] yes [ ] no | Will this operation involve use of heavy metals such as mercury, silver, or cadmium? |
| | **1i.** | [ ] yes [ ] no | Does this operation involve the use or transportation of explosives or explosive wastes? |
| **2.** | [ ] yes [ ] no | Are there any accelerators or other radiation generating devices involved in this operation? | |
| | **2a.** | [ ] yes [ ] no | Is there an accelerator used in this operation? |
| | **2a(1).** | [ ] yes [ ] no | Does this operation use accelerators that are built locally or are commercially available units that have been modified? |
| | **2b.** | [ ] yes [ ] no | Are there any radiation generating devices (RGD) used in this operation? |
| | **2b(1).** | [ ] yes [ ] no | Are radiation generating devices capable of creating a High Radiation Area (>100 mrem/hr at 30 centimeters)? |
| | **2b(2).** | [ ] yes [ ] no | Are the radiation generating devices capable of creating a radiation area? |
| | **2c.** | [ ] yes [ ] no | Does the radiation generating device only produce radiation incidental to its primary function (such as electron microscopes, electron beam welders, ion implantation equipment)? |
| | **2c(1).** | [ ] yes [ ] no | Does this operation use RGDs that are built locally or are commercially available units that have been modified? |
| | **2d.** | [ ] yes [ ] no | Is the radiation generating device an intentional x-ray generating device which produces radiation as part of the primary function (i.e. x-ray diffractometers, x-ray machines)? |
| | **2d(1).** | [ ] yes [ ] no | Is the device built locally or been modified OR is it being used outside design specifications? |

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| **3.** | [ ] yes [ ] no | Are radioactive materials (including sealed sources and wastes) generated, handled, processed, used or stored? | |
| | **3a.** | [ ] yes [ ] no | Does this operation involve handling of radioactive materials or sources? |
| | **3b.** | [ ] yes [ ] no | Does this operation involve radionuclides listed in the Radionuclide Threshold Table in amounts which exceed 10% of the quantity listed? |
| | **3c.** | [ ] yes [ ] no | Is dispersible radioactive material being used in this operation? |
| | **3d.** | [ ] yes [ ] no | Will any radioactive material/waste be transported as a result of this operation? |
| | **3e.** | [ ] yes [ ] no | Does this operation involve any accountable sources? (Sealed Radioactive Source Accountability Table) |
| | **3f.** | [ ] yes [ ] no | Any radioactive material being left or stored at Department/Division facilities? |
| **4.** | [ ] yes [ ] no | Are there any possible environmental impacts with this operation? | |
| | **4a.** | [ ] yes [ ] no | Are there any non-radioactive emissions or effluents from this operation? |
| | **4b.** | [ ] yes [ ] no | Are there any radioactive emissions or effluents from this operation? |
| | **4c.** | [ ] yes [ ] no | Is any waste generated from this operation? |
| | **4c(1).** | [ ] yes [ ] no | Is the waste radioactive? |
| | **4c(2).** | [ ] yes [ ] no | Is the waste hazardous? |
| | **4c(3).** | [ ] yes [ ] no | Is the waste mixed waste? |
| | **4d.** | [ ] yes [ ] no | Are any hazardous materials (such as lead, mercury or beryllium) being left or stored at Department/Division facilities? |
| | **4e.** | [ ] yes [ ] no | Does this operation require any new above or under ground storage tanks? |
| | **4f.** | [ ] yes [ ] no | Does this operation use ozone depleting substances? |
| | **4g.** | [ ] yes [ ] no | Are any changes required to the Environmental Management System (as determined by the Environmental Compliance Rep)? |
| | **4h.** | [ ] yes [ ] no | Is this work being done within 1/2 mile of the Peconic River? |
| **5.** | [ ] yes [ ] no | Does this operation involve the use of lasers? | |
| | **5a.** | [ ] yes [ ] no | Do personnel use or have the potential to be exposed to Class IV lasers? |
| | **5b.** | [ ] yes [ ] no | Do personnel use or have the potential to be exposed to Class IIIb lasers? |
| | **5c.** | [ ] yes [ ] no | Does the operation involve Class I, II or IIIa lasers? |
| | **5d.** | [ ] yes [ ] no | Does this operation involve Class I lasers with embedded IIIb or IV lasers? |
| | **5e.** | [ ] yes [ ] no | Have any of the lasers involved in this operation been built locally or have any commercially available lasers been modified? |
| | **5f.** | [ ] yes [ ] no | Is the laser registered at BNL with the Laser Safety Officer? |
| **6.** | [ ] yes [ ] no | Is any energized electrical equipment used in this operation? | |
| | **6a.** | [ ] yes [ ] no | Is there any exposed electrical components where there is the potential for personnel to be exposed to voltages greater then 50V (Range A)? |
| | **6b.** | [ ] yes [ ] no | Is it required for personnel to work on energized systems greater than 50 V (Range A) but less than 600 V (Range B&C)? |
| | **6c.** | [ ] yes [ ] no | Is it required for personnel to work on energized systems greater than 600 V (Range D)? |
| | **6d.** | [ ] yes [ ] no | Has this equipment been built locally, modified or NOT listed by a Nationally Recognized Testing Laboratory? |
| | **6e.** | [ ] yes [ ] no | Does your operation require the development of an Electrical Working Hot Permit (EHWP)? |
| | **6f.** | [ ] yes [ ] no | Are emergency shut-off controls provided for shutting down electrical power? |
| | **6g.** | [ ] yes [ ] no | Is required fusing provided for all relevant equipment? |
| **7.** | [ ] yes [ ] no | Are there any mechanical hazards or work hazards such as material handling, elevated work, vacuum or pressure vessels, scaffolds, stored energy or structural considerations? | |
| | **7a.** | [ ] yes [ ] no | Are there any material handling devices including all large moving equipment? |
| | **7b.** | [ ] yes [ ] no | Does the operation include the use of a hoist, crane, forklift, or rigging? |
| | **7c.** | [ ] yes [ ] no | Are there any structures supporting heavy loads? |

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| | **7d.** | [ ] yes [ ] no | Does this operation require a structural change to any crane or building? |
| | **7e.** | [ ] yes [ ] no | Will you be purchasing any ladders or scaffolds? |
| | **7f.** | [ ] yes [ ] no | Will this operation require any elevated work? |
| | **7g.** | [ ] yes [ ] no | Does work require fall protection equipment (i.e. harness, lanyard)? |
| | **7h.** | [ ] yes [ ] no | Does the operation include the use of hydraulic or pneumatic lift? |
| | **7i.** | [ ] yes [ ] no | Does any equipment operate at pressures above 15 psig or under a vacuum? |
| | **7j.** | [ ] yes [ ] no | Does this system have any vacuum windows? |
| | **7k.** | [ ] yes [ ] no | Is any part of this system/operation involve a cryogenic system or dewar installation? |
| | **7l.** | [ ] yes [ ] no | Does the operation include the use of typical shop equipment? |
| | **7m.** | [ ] yes [ ] no | Are there any sources of stored energy (hydraulic, pneumatic, thermal, mechanical)? |
| | **7m1.** | [ ] yes [ ] no | Is the source capable of being easily isolated or can it be LOTO'd? |
| | **7m2.** | [ ] yes [ ] no | Is disassembly required to isolate energy (i.e. inserting blank flange)? |
| **8.** | [ ] yes [ ] no | Does this operation require work with or generate any of the following physical hazards--confined spaces, RF or microwave radiation, magnetic fields, hot or cold surfaces, high noise levels, or oxygen deficiency? | |
| | **8a.** | [ ] yes [ ] no | Does this operation create any space that might meet the definition of a confined space? |
| | **8b.** | [ ] yes [ ] no | Is it required for personnel to enter any Class 1 Confined Spaces? |
| | **8c.** | [ ] yes [ ] no | Is it required for personnel to enter any Class 2A or 2B Confined Spaces? |
| | **8d.** | [ ] yes [ ] no | Is it required for personnel to enter any Class 2C Confined Spaces? |
| | **8e.** | [ ] yes [ ] no | Is there any radiofrequency or microwave field generated by a source greater than 7W in a space that might be occupied? |
| | **8f.** | [ ] yes [ ] no | Does this equipment/operation produce any magnetic fields greater than 4 Gauss? |
| | **8g.** | [ ] yes [ ] no | Is it required for any personnel to be exposed to a magnetic field greater than 600 Gauss? |
| | **8h.** | [ ] yes [ ] no | Are there any surface temperatures less than 0 deg F or greater than 150 deg F? |
| | **8i.** | [ ] yes [ ] no | Does this operation generate any equipment which could operate at greater than 80 dbA? |
| | **8j.** | [ ] yes [ ] no | Is it required for personnel to work in an area with a Noise Level between 85-100 dBA? |
| | **8k.** | [ ] yes [ ] no | Is it required for personnel to work in an area with a Noise Level above 100 dBA? |
| | **8l.** | [ ] yes [ ] no | Is there any possibility of creating an Oxygen Deficient Atmosphere? |
| | **8m.** | [ ] yes [ ] no | Is it required for any personnel to work in an existing Oxygen Deficiency Hazard Area? |
| **9.** | [ ] yes [ ] no | Are there any additional hazards, not mentioned above, that should be considered? Such as biological hazards, ergonomics or heat stress? | |
| | **9a.** | [ ] yes [ ] no | Could a worker be exposed to any biological hazard including handling of human body fluids, human tissues, or mouse droppings? |
| | **9b.** | [ ] yes [ ] no | Will personnel perform functions that involve repetitive motion, excessive force or vibration, lifting, or other ergonomic concerns? |
| | **9c.** | [ ] yes [ ] no | Will personnel be required to perform this operation in extreme climates or temperatures? |
| **10.** | [ ] yes [ ] no | Does this operation involve the use of equipment, tools or materials outside of the design specifications or outside of the manufacturer's recommendations OR the use of equipment or apparatus not commercially available? | |
| | **10a.** | [ ] yes [ ] no | Has this equipment received review by the appropriate authority having juridiction? |

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| | **10b.** | [ ] yes [ ] no | Was this equipment built at a University or Laboratory in another country? |
| **11.** | [ ] yes [ ] no | Will this operation require trained operators or close surveillance? | |
| | **11a.** | [ ] yes [ ] no | Will this operation be left unattended? |
| | **11b.** | [ ] yes [ ] no | Will operation require work outside normal working hours? |
| | **11c.** | [ ] yes [ ] no | Will this operation require 2-person rule? |
| | **11d.** | [ ] yes [ ] no | Will this operation require special attention in the event it is left unexpectedly for long periods of time? |
| | **11e.** | [ ] yes [ ] no | Will this operation require an emergency procedure due to unusual or complicated shutdown instructions? |
| | **11f.** | [ ] yes [ ] no | Will group operational procedures be required for normal operation of this equipment? |
| | **11g.** | [ ] yes [ ] no | Is there a list of designated and trained personnel for this equipment/operation? |
| | **11h.** | [ ] yes [ ] no | During construction, use, or storage of spare parts and materials, are valuable materials attractive for theft and worth more than $1000 (e.g. precious metals; or copper, platinum, tungsten, stainless, aluminum) involved with this project? |
| **12.** | [ ] yes [ ] no | Are there any fire protection or life safety concerns in this operation? | |
| | **12a.** | [ ] yes [ ] no | Will welding or cutting or spark/flame producing operations be conducted in association with this operation? |
| | **12b.** | [ ] yes [ ] no | Does this operation generate, store or use any combustible materials in significant quantities? |
| | **12c.** | [ ] yes [ ] no | Will this operation require a deviation from the Life Safety Code (consider changes in exits, change in occupancy? |
| | **12d.** | [ ] yes [ ] no | Will this operation change the risk level of fire protection? |
| | **12e.** | [ ] yes [ ] no | Could this equipment act as an ignition source? |
| **13.** | [ ] yes [ ] no | Are there any engineering controls or Personal Protective Equipment (PPE) required (i.e., ventilation, fume hoods, interlocks, HEPA filters/vacuum cleaners, respirators)? | |
| | **13a.** | [ ] yes [ ] no | Is any local ventilation used in this operation? |
| | **13b.** | [ ] yes [ ] no | Are interlocks used in this operation? |
| | **13c.** | [ ] yes [ ] no | Is any personal protective equipment used in this operation? |
| | **13c(1)** | [ ] yes [ ] no | Are gloves used in this operation? |
| | **13d.** | [ ] yes [ ] no | Are HEPA filters in place/used? |
| | **13d(1).** | [ ] yes [ ] no | On ventilation systems? |
| | **13d(2).** | [ ] yes [ ] no | HEPA vacuum cleaners? |
| | **13e.** | [ ] yes [ ] no | Will respiratory protection be required for this operation? |
| **14.** | [ ] yes [ ] no | Do you rely on any facility utilities (listed as sub-questions) to provide safety controls for your operations? | |
| | **14a.** | [ ] yes [ ] no | Compressed Air |
| | **14b.** | [ ] yes [ ] no | Compressed Gas |
| | **14c.** | [ ] yes [ ] no | Chilled Water |
| | **14d.** | [ ] yes [ ] no | De-Ionized/De-mineralized Water |
| | **14e.** | [ ] yes [ ] no | Electric Power (includes Grounding and UPS) |
| | **14f.** | [ ] yes [ ] no | Emergency electrical power |
| | **14g.** | [ ] yes [ ] no | Fire Protection |
| | **14h.** | [ ] yes [ ] no | Hoists and Cranes |
| | **14i.** | [ ] yes [ ] no | Heating Water |
| | **14j.** | [ ] yes [ ] no | Non-potable Water |
| | **14k.** | [ ] yes [ ] no | Oxygen Monitoring System |
| | **14l.** | [ ] yes [ ] no | Public Address |
| | **14m.** | [ ] yes [ ] no | Potable Water |

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| | **14n.** | [ ] yes [ ] no | Process Cooling Water |
| | **14o.** | [ ] yes [ ] no | Sanitary Sewer |
| | **14p.** | [ ] yes [ ] no | Steam |
| | **14q.** | [ ] yes [ ] no | Utility Gas (natural gas) |
| | **14r.** | [ ] yes [ ] no | Vacuum |
| | **14s.** | [ ] yes [ ] no | Ventilation Supply/Exhaust |
| **15.** | [ ] yes [ ] no | Are you aware of any other hazardous conditions or potential sources of hazards that have not previously been addressed by these questions that you feel deserves further consideration? | |