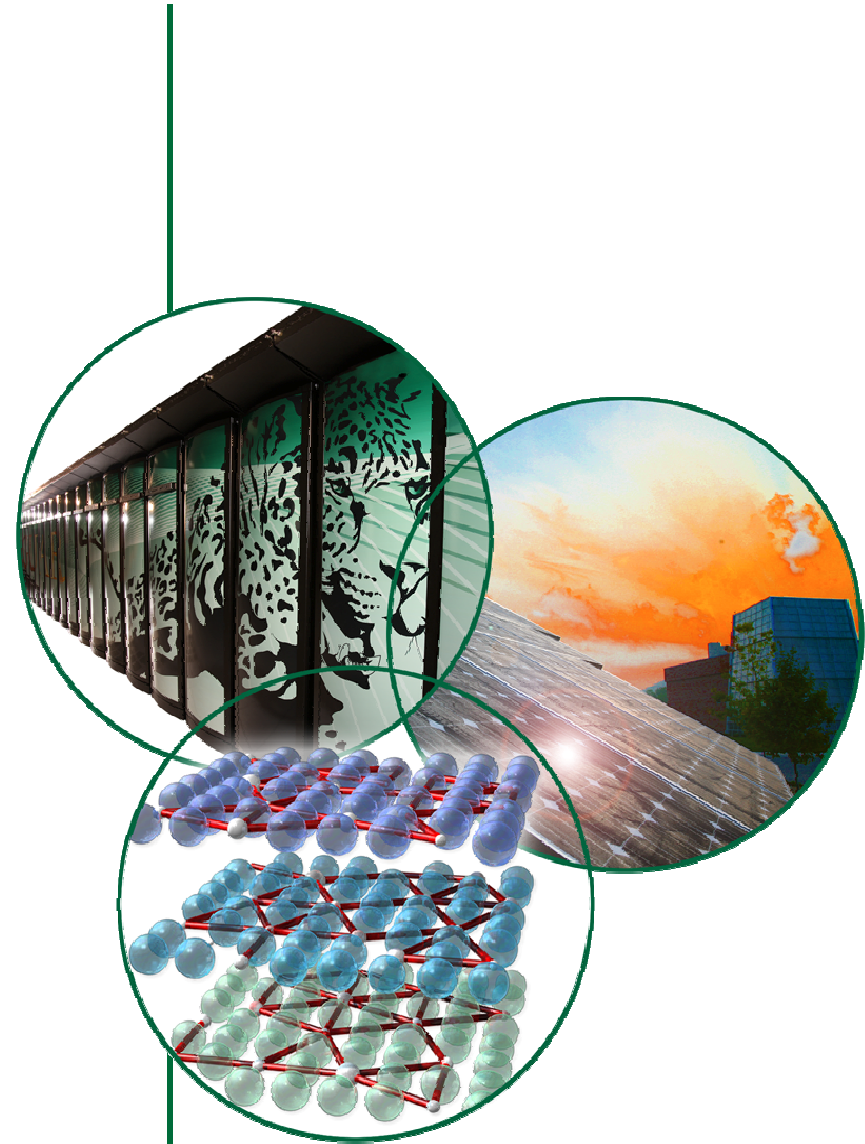


Configuration Control and Implementation of Safety Principles on the Research Side of the HFIR Site Operations

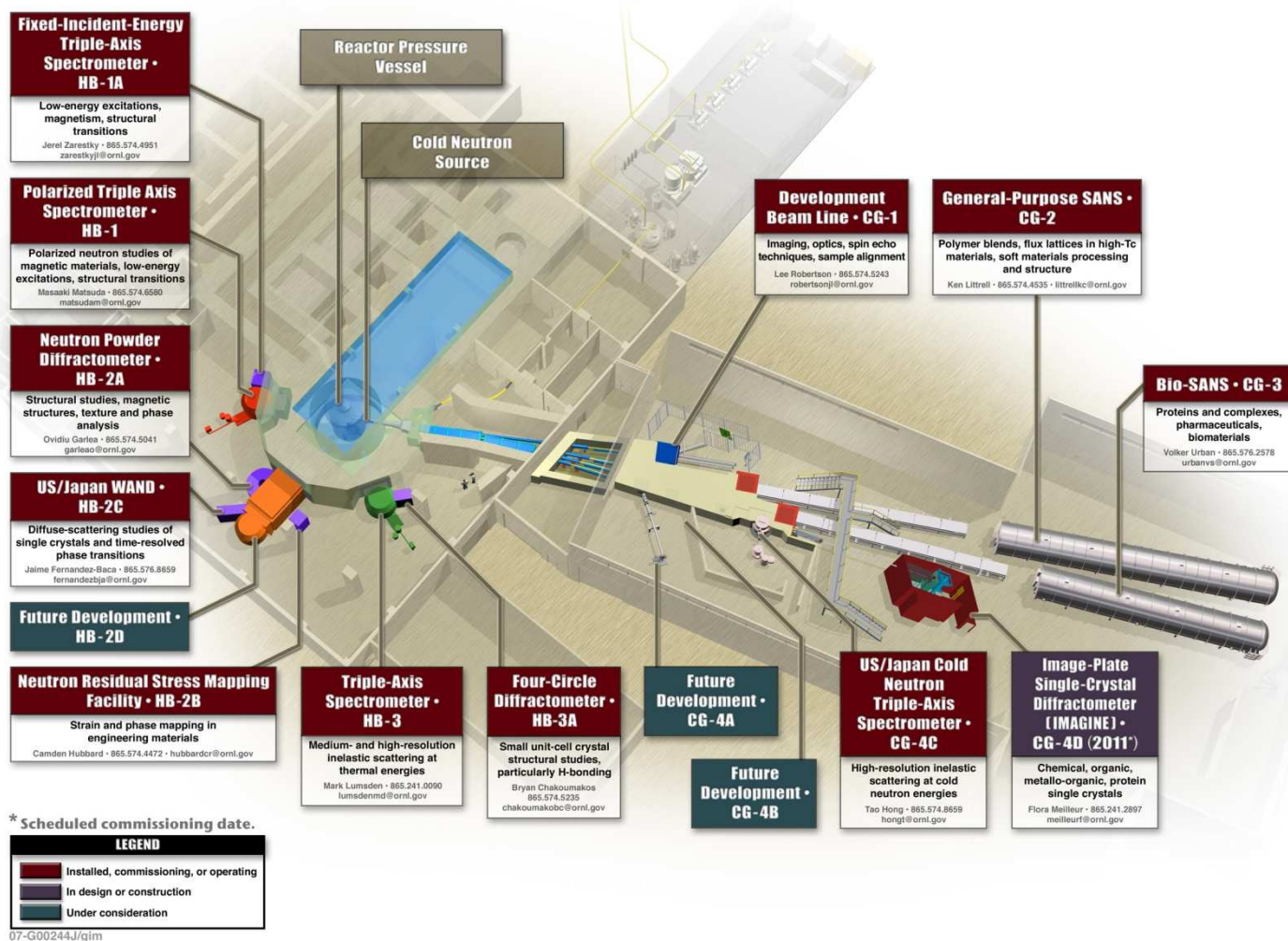
By Douglas Selby and Lisa Fagan

Oak Ridge National Laboratory

Presented at the 2010 TRTR/IGORR
Conference



HFIR Reactor and Neutron Science Instrument Layout



Formal User Program at HFIR

- **Formal user program started in 2003 for three instruments and has now grown to 9 instruments with 4 additional instruments expected to be added to the program over the next 18 months.**
 - **FY 2003: 51 users**
 - **FY 2005: 96 users**
 - **FY 2009: 358 users**
- **The implications of having a significant number of non staff scientists and researchers on site working with the neutron beams raised a number of concerns about science and safety issues.**

Evaluation of Relationship Between HFIR Reactor Operations and Science Operations on the HFIR Site

- **About eight years ago the management of the reactor and neutron science divisions decided to take a hard look at the relationship between reactor operations and science operations on the reactor site**
 - Triggered by a number of incidents over a several year period
- **What we found was that a number of problems could be traced to a lack of real communication between the two groups and a general feeling by the staff in each group that there was no need to know what the other group was doing**
 - Reactor management did not fully understand the concept of predictability being as important as availability nor was there an understanding that the science side needed to be kept informed of reactor issues
 - Science side had little understanding of the need for configuration management and the need to track and control the introduction of hazards on the reactor site

The Conclusion from this Self Assessment was that We had a Formula for Disaster and We Needed to Address this Problem

- **MOU was developed and approved by all three responsible divisions (NSSD, NFDD, and RRD)**
- **Science side Configuration Control Committee established**
- **NS 1.1 Procedure was developed and approved for new instrument and instrument modification projects**
- **ES&H review of all experiments and an ES&H staff person was placed on site in 2008 to support science operations**
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- **All Instrument Technical Operating Guidelines were revised**
- **Formal work control processes for maintenance and installation activities implemented.**

MOU Between Three Divisions Developed

- This MOU established communication paths, reporting requirements, and interfaces
- MOU Review between RRD and NFDD was established as an early step in any new project to review applicable interfaces with the RRD to establish reporting requirements and reviews that needed to involve reactor engineering and operations
- This review also established requirements in such areas as seismic and fire loading qualifications where equipment associated with a science instrument was perceived to have potential impact on reactor safety related equipment in the area.

NS 1.1

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APPENDIX C

CNS MOU REVIEW SCREENING FORM

TITLE OF PROJECT _____

DATE OF REVIEW _____

MOU(s) REVIEWED _____

REACTOR IMPACTS:

YES	NO	
___	___	Reactor Structures, Systems, Components _____
___	___	Reactor Procedures _____
___	___	Reactor Building Fire Hazard Analysis _____
___	___	Reactor Safety Analysis Report _____
___	___	Special Building Hot Exhaust _____
___	___	Reactor Hazardous Materials Limits/Excl _____
___	___	Other _____

COLLOCATED PROJECT IMPACTS:

YES	NO	
___	___	Instrument Operations _____
___	___	Magnetic Fields _____
___	___	Space/Location _____
___	___	Radiological Backgrounds _____
___	___	Facility Support Services _____
___	___	Noise _____
___	___	Vibration _____
___	___	Other _____

CNS FACILITY MODIFICATIONS (also 7970/7970A/7972)

YES	NO	
___	___	Structure _____
___	___	Electrical _____
___	___	Compressed Air _____
___	___	Chilled Water _____
___	___	Building Exhaust _____
___	___	Fire Suppression _____
___	___	Fire Alarm System _____
___	___	Ingress/Egress _____
___	___	Decommissioning Costs _____
___	___	Other _____

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Neutron Instrument Configuration Control Committee (CCC)

- CCC composed of NSSD, NFDD, RRD, and ES&H staff
- Meets on an as needed basis
- Committee focuses on the review of the process rather than technical review of an activity

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NS 1.1 Procedure is Controlling Document for New Projects

- Establishes CCC review points
 - Design
 - Procurement
 - Installation
 - Commissioning
 - Normal Operation
- Establishes Documentation and Testing Requirements
 - ALARA
 - Design Reviews
 - Hazard Analysis
 - Technical Operating Guideline
 - Radiological Surveys
- Also establishes Project Management Requirements

**APPENDIX A
CNS NEW/MODIFIED INSTRUMENT ACTIVITIES CHECKLIST**

The items listed below provide an outline of the activities presented by this guideline. Note that all items with an (R) in the "Applicable" column are required as a result of SBMS procedure, CNS policy, RRD/CNS MOU, or other laboratory policies. All items with a N/A indication are considered to be not applicable to this project.

TITLE OF PROJECT: _____

	Applicable	Completed	Comments/Date
1. Design/Modification			
a) Project Execution Plan	(R)	<input type="checkbox"/>	_____
- Project Description and Design Requirements	<input type="checkbox"/>	<input type="checkbox"/>	_____
- Project Management Plan	<input type="checkbox"/>	<input type="checkbox"/>	_____
- Configuration Management Plan	<input type="checkbox"/>	<input type="checkbox"/>	_____
- QA Plan	<input type="checkbox"/>	<input type="checkbox"/>	_____
- Cost Plan	<input type="checkbox"/>	<input type="checkbox"/>	_____
- Project Schedule	<input type="checkbox"/>	<input type="checkbox"/>	_____
- Design Review Documentation	<input type="checkbox"/>	<input type="checkbox"/>	_____
- Major Milestone Plan	<input type="checkbox"/>	<input type="checkbox"/>	_____
b) NEPA or Exclusion Review Document	(R)	<input type="checkbox"/>	_____
c) PAAA Screening	(R)	<input type="checkbox"/>	_____
d) Initial ALARA Review	(R)	<input type="checkbox"/>	_____
e) Initial Instrument Layout Review	(R)	<input type="checkbox"/>	_____
f) Instrument Safety and Hazard Evaluation	(R)	<input type="checkbox"/>	_____
g) Instrument Safety and Hazard Evaluation Review	(R)	<input type="checkbox"/>	_____
h) RRD Interface Manager Notified	(R)	<input type="checkbox"/>	_____
i) MOU Review/Screening	(R)	<input type="checkbox"/>	_____
j) RSS Screening	(R)	<input type="checkbox"/>	_____
k) Approval for Major Fabrication/Procurement(s)	(R)	<input type="checkbox"/>	_____
2. Fabrication/Procurement			
a) Procurement specifications	(R)	<input type="checkbox"/>	_____
b) Bid review and other subcontract documentation	<input type="checkbox"/>	<input type="checkbox"/>	_____
c) Deviation Requests and Nonconformances	(R)	<input type="checkbox"/>	_____
d) Procurement QA files	(R)	<input type="checkbox"/>	_____
e) Inst. Proj. Leader Indication of Readiness to Install	(R)	<input type="checkbox"/>	_____
f) CCC Concurrence to Proceed with Installation	(R)	<input type="checkbox"/>	_____

NS 1.1 Also Requires a Hazard Analysis Screening Followed by a Hazard Mitigation Document

NS 1.1

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APPENDIX B
**INSTRUMENT HAZARD IDENTIFICATION
 & SCREENING FORM**

TITLE OF PROJECT: _____

RADIOLOGICAL

- Beam Access _____
 - Engineered Restriction _____
 - Administrative Restrictions _____
- Shielding Hazards and Beams Modifiers (or other components that may be placed in the beam)
 - Activation _____
 - Prompt Radiation _____
 - Scatter _____
- Background Contribution
 - Neutrons _____
 - Gamma _____
 - Personnel _____
 - Adjacent Instruments _____

FISSIONABLE MATERIALS _____

EXPLOSIVE MATERIALS _____

CONFINED SPACE _____

- Permitted
- Non-Permitted

HAZARDOUS MATERIALS (Lead, Cadmium, Beryllium, etc) _____

HIGH VOLTAGE _____

HIGH CURRENT _____

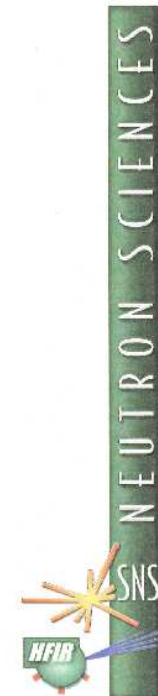
MACHINE GUARDING _____

- Pinch Points
- Motion/Speed
- Gears/Chains
- Electropneumatic/Electromechanical Lifters/Drivers

COMPRESSED GASES/AIR _____

US/Japan Cold Neutron
 Triple-Axis Spectrometer
 CG4C (HFIR)

Hazard Identification and
 Analysis



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IPTS –Integrated Proposal Tracking System

- **Part of the safety review process is facilitated through the proposal system used by researchers. Currently this includes review of the sample and eventually the experimental conditions**
- **Some experiments may require extensive reviews by Fire Protection , Radiation Office, Instrument support , Sample Environment or the Biosafety Committee. This is presently a manual operation that requires coordination and communication between divisions.**
- **The evolution of proposal system has multiple reviewers required to provide oversight , input and approval.**
- **Extraordinary conditions are communicated to RRD interface by ESH Coordinator and a determination is made on whether any special interactions are required**

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End of cycle reviews are held as a joint meeting of divisions

- These help to identify any issues good or bad that occurred during the last cycle.
- Input obtained from users by the user office is discussed at this meeting
- Science staff and reactor operations staff supply input as well
- Things are discussed and solutions to any problems are worked on to prevent reoccurrence.
- Findings from these end of cycle reviews are then discussed at a monthly management meeting of the three divisions

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Part of the ESH onsite support included updating the Technical Operating Guidelines for the Instruments

- The Science Instrument documents have been updated to reflect coordination between divisions based on NS 1.1 and the MOU
- This system has been implemented for both previously installed (modifications of) and newly proposed instruments.



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Although we have Separate Work Activities on the HFIR Site Tied to Three Divisions We are Working to Communicate as One Group

