Spallation Neutron Source **Acceptance Strategy**

Page 1 of ___ WBS Number _____ (__) *opt. AS # within WBS* QA Level __ (opt) Rev. ___

Title Energy Degrader / Faraday Cup System

Description _____

Originator _____ Lab _____

(originator may list his/her part of the total strategy and request others to add to the list, but the final version must be approved)

#	Expectation	Location	Responsibility	Verified by	Date
0	**Background information** The Faraday Cup system consists of four major components: a) The beamline devices/assemblies: faraday cup with energy degrader, feedthroughs, pneumatic actuator. b) Cabling and air, water hoses. c) Network attached devices (NAD) consisting of a PC and associated mounting hardware, analog and digital boards, link interface, power connection via RABBITS, auxiliary electronics (i.e. air valve control, bias supplies) and software (device drivers, LabVIEW VI's, dll's, channel access software, BIST software, gate array image, initialization file, etc). NAD has the following well-defined interfaces (as documented in the ICD): network, event link, RTDL, MPS, power, I/O. d) As-built documentation: mechanical drawings, schematics, block diagrams, PCB/BOM files, commented source code, system configuration and initialization data, ICD, user manual, test procedures and software, troubleshooting guide, installation procedure, Test Reports/ QA records (Traveler), turn-on/set-up procedures, cable data, vendor-provided documentation. Notes on responsibility: • LANL has responsibility for the overall system design and construction of all components. • Cable plant testing and verification: ORNL. • Electronics racks installation and preparation: ORNL. • RABBITS and network cabling: ORNL. • User interface software: ORNL. • NADs, including LabVIEW VIs and client access software: LANL (includes content from LBNL) • Documentation: As-built documentation for each component is provided by LANL. System documentation (user manual, cabling data, etc) is provided by LANL as a first article and then maintained by ORNL on the project website and Oracle database. Cabling data including specification, length, termination, and routing. ORNL will provide barcode labels for major	ORNL LANL	LANL	ORNL	

	components.				
1	**Final design review(s) complete.** Final design documents are available on website along with Diagnostic Advisory Committee report/response. The following acceptance criteria are detailed in these documents: • Minimum and target performance requirements • Qualification test procedure: vertical integration tests that demonstrate potential to achieve target performance. • Component acceptance test procedures: tests of individual components that confirm minimum performance.	TBD	LANL	ORNL	
2	**Design Verification Tests** Vertical integration tests are performed on the bench at LANL and optionally, in parallel at ORNL. Individual component tests performed at LANL. These tests use pre-production components and must demonstrate that the system design is fundamentally capable of achieving the target performance requirements.	LANL/ ORNL/	LANL/ ORNL	ORNL	
3	**First Article Acceptance** Each first article component will be received and tested by the lab that designed it. The responsibilities are summarized in item 2, Design Verification. ORNL staff will participate in the tests at LANL and perform some tests in parallel at the RATS building. ORNL staff will participate in vendor visits. Beamline device: Measurements/Bench tests of each Faraday cup is performed to determine its electrical performance. Visual and vacuum integrity of the item is successfully verified based on the final, as built documentation. Tests of cooling capability (e.g. flow rate and water pressure) will be performed. Pneumatic actuators/mechanical components: Mechanical testing, vibration analysis and vacuum integrity after a multiple cycles are confirmed. Cable, hoses: Cable assemblies will be tested with the electronics. Layout of the racks will be confirmed by ORNL. Air and water hookups will be pressure tested. NADS: First article NAD (including beta software) will be tested. The test environment includes simulated beam signals, final cable types, event/RTDL inputs, and channel access client software. Testing will be performed under simulated SNS physical environmental conditions, network traffic, event rates, and client loads. Seamless integration with the EPICS	ORNL/ LANL	ORNL/ LANL	ORNL	

	control system will be demonstrated. In particular, the interface to MPS will be tested to assure that long beam pulses will not destroy the faraday cups. System must run for more than 10 days without intervention. Documentation: Final, as built documentation will be released.				
4	**Production Unit Acceptance** All production units are received and acceptance tested at RATS by ORNL personnel. All vendors' warranties are transferred to ORNL. Partner lab personnel will be available for consulting and will maintain test facilities at their site. If required, the responsible partner lab will repair units that fail acceptance tests. Test and repair can take place at RATS or at the partner lab. The handoff will be declared complete when the last article passes acceptance tests at ORNL. Faraday Cup: Accepted at RATS as part of an integrated assembly. Cables, hoses: Accepted from vendor at RATS. Pneumatic actuators/mechanical components: Accepted at RATS. NADs: Accepted at RATS. 48 hours of successful burn-in where applicable. Documentation: After the first article acceptance, ORNL staff will revise documentation to match accepted components. Partner lab staff will consult in this process.	ORNL	ORNL	LANL	

Role	Name *(originator may suggest approvers)*	Plan Approval Signature	Date
SNS Division	Craig Deibele	C Deibele	11/9/01
	Tom Shea	[signature]	11-9-01
	Norbert Holtkamp	[signature]	11-9-01
LANL	Mike Plum, Diagnostics WPM	M. A. Plum	9/Nov/01
	Mark Gardner, QA Representative	[signature]	11/06/01
	Will Fox, Project Office	[signature]	11/06/01
	Don Rej, Division Director	[signature]	11/6/01

Systems Integration		
SNS ES&H		
SNS QA		

Items/System Accepted at SNS

Installation Manager or designee *Printed Name* *Signature* *Date:*