FESHM 2005: Operational Readiness Clearance

Revision History

Author	Description of Change	Revision Date
Eric McHugh	Changes to give ORC chairperson authority to customize the ORC panel composition per the hazards presented to match current practices	February 2018
Eric McHugh	Editorial changes to clarify that this chapter applies to other Fermilab sites and not just Fermilab proper	December 2017
Eric McHugh	Updated Technical Appendix to include: • DocDB references to guidance chapters compiled by Fermilab Subject Matter Experts for ORC reviews • Electrical Safety ORC Review Guidelines • Environmental ORC Review Guidelines • Fire/Life Safety ORC Review Guidelines	January 2017
Amber Kenney Eric McHugh Kathy Zappia Raymond Lewis Don Cossairt Richard Ruthe John Anderson, Jr.	Initial release of chapter • Defines a lab-wide process for ORCs applicable to experiments, tests, R&D and other activities required by D/S management that have the potential to cause harm to personnel, property or the environment • Defines a standard terminology for ORCs • Introduces the online/automated ORC review and approval process • Provides an appendix that includes references to all other FESHM required ESH reviews	September 2016

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1.0 INTRODUCTION

This FESHM chapter describes the Operational Readiness Clearance (ORC) process that is applicable to experiments, tests, research and development (R&D) activities and, at the discretion of division/section management, other activities on the Fermilab site as well as Fermilab leased spaces. It is a formal ES&H review that utilizes a group of subject matter experts (SMEs), the ORC Committee, to review constructed equipment or systems that have the potential to cause harm to personnel, property, or the environment. The ORC must be completed and approved prior to the commencement of operations.

The ORC program is designed as a graded approach. The level of detail required is commensurate with the potential Environmental, Safety, and Health (ES&H) impact of the activity. The Quality Assurance Manual and the Engineering Manual shall be used to determine the level of documentation and review required for the activity. The Fermilab Environment, Safety and Health Manual (FESHM), inclusive of the Fermilab Radiological Control Manual (FRCM), specifies a set of physical and administrative conditions that define the boundaries for safe operation.

2.0 DEFINITIONS

2.1 Activity Owner

The Activity Owner is the person responsible for the safety and operation of the activity. They collect required documentation and request the Operational Readiness Clearance.

2.2 Beam Coordinator

The Beam Coordinator is a Fermilab employee responsible for the operations and safety of a particular beamline area, accelerator, or detector enclosure.

2.3 ES&H Review

Reviews consisting of environment, safety, and health aspects of activities to ensure personnel safety, protection of the environment, and compliance. See section 5.0 Technical Appendix.

2.4 Facility Manager

The Facility Manager is a Fermilab employee with supervisory authority over a given space or program area at Fermilab.

2.5 Operational Readiness Clearance (ORC)

Process to review experiments, tests, R&D or other activities as appropriate to ensure all ES&H issues or programmatic concerns are properly mitigated prior to the activity's start up.

2.6 Operational Readiness Clearance Chairperson

Person who coordinates and conducts the ORC review.

2.7 Operational Readiness Clearance Committee

A collection of subject matter experts who conduct the Operational Readiness Clearance review of activities that meet the intent of this chapter or at the discretion of the Division Management or the Division Safety Officer.

2.8 ORC Point of Contact (POC)

Person who is responsible for coordinating the ORC review with the ORC chairperson. The Activity Owner may act as the ORC POC or may delegate this responsibility.

3.0 RESPONSIBILITIES

3.1 Accelerator Division Operations Department Head

The AD Operations Department Head is responsible for reviewing and approving *ORC Beam* requests after the ORC Chairperson approves and initiates the approval process. This role is applicable to the ORC *with Beam* Approval Flow, see Figure 2.

3.2 Accelerator Division Radiation Safety Officer

The AD Radiation Safety Officer (RSO) is responsible for reviewing and approving *ORC Beam* requests after the ORC Chairperson approves and initiates the approval process. This role is applicable to the ORC *with Beam* Approval Flow, see Figure 2.

3.3 Activity Owner

The Activity Owner is responsible for discussing the activity with the Division Safety Officer to determine the required ES&H reviews.

3.4 Beam Coordinator

The Beam Coordinator is responsible for assisting Activity Owners to schedule equipment installation in beamline enclosures and submitting the *ORC Beam* form for ES&H review. The Beam Coordinator is also responsible to review and approve *ORC Beam* requests after the ORC Chairperson approves and initiates the approval process.

3.5 Chief Safety Officer (CSO)

The Chief Safety Officer is responsible for the development of this policy and oversight of its implementation.

3.6 Division/Section (D/S) Head/Project Manager

The D/S Head/Project Manager (or designee) is responsible for implementing this chapter's requirements in their organization. The ORC may span multiple divisions thus multiple D/S Heads/Project Managers may be involved in the approval of the ORC. The landlord Division is the lead organization for the ORC.

D/S Heads are responsible for:

- Appointing subject matter experts to chair or serve on the ORC committees and panels.

- Appointing a Beam Coordinator at locations where experiments, tests or R&D activities may be installed in a beamline (e.g., Fermilab Test Beam Facility, M03, Fermilab Accelerator Science & Technology Facility).
- Reviewing the recommendations to operate from committee and panel chairpersons, and ultimately approving operations. When more than one organization is involved in the activity, the tenant D/S Head/Project Managers(s) must give approval and the landlord D/S Head gives final authorization to operate.
- Ensuring that the ORC information is entered in the online database (https://fermipoint.fnal.gov/service/tsworc).
- Fielding requests for resource needs or scope changes through the Facility Manager.

3.7 Division Safety Officer (DSO)

The DSO assists the D/S Head to ensure the requirements of this chapter are implemented in their organization. The DSO may recommend an ORC be completed for activities beyond the scope of this chapter based on their professional judgement.

3.8 Facility Manager

The Facility Manager acts as a liaison between the Activity Owner, the D/S Office, and the DSO for resource allocation, ES&H reviews, and ORC reviews. They will conduct preliminary reviews of proposed activities and help to determine if an ORC is required. In addition, the Facility Manager should be aware of proposed scope changes and determine if another ORC is required. The Facility Manager is also responsible to review and approve *ORC Beam* and *ORC No Beam* requests after the ORC Chairperson approves and initiates the approval process.

3.9 ORC Chairperson

The ORC Chairperson coordinates a timely ORC review with subject matter experts, independent of the activity, to ensure required ES&H reviews have been performed, any identified deficiencies have been resolved, and recommends approval of operations. The ORC Chairperson has the authority to comprise the ORC committee with SMEs commensurate with the hazards presented by the activity. The ORC chairperson, in conjunction with the ORC Point of Contact, determines if the request is No Beam (Figure 1) or with Beam (Figure 2) and will follow the appropriate workflow.

3.10 ORC Committee

The ORC Committee is responsible for conducting the ORC review to ensure all ES&H issues are properly managed. It will review documents, such as equipment designs and written procedures or hazard analyses, ensure engineering notes are properly captured, and inspect equipment. The Committee shall recommend full or conditional operations. If conditional approval is given, the reviewer shall explain the conditions that must be met before operation may proceed.

3.11 ORC Point of Contact

The ORC Point of Contact (POC) is the individual responsible for requesting an ORC for the activity that requires review. The ORC POC may vary based the activity (e.g., activity owner,

project lead, project engineer, scientist or user). The ORC POC is responsible to carry out the ORC procedure defined in Section 4.0.

4.0 PROGRAM DESCRIPTION

The Operational Readiness Clearance process must be completed prior to commencement of operation for all experiments, tests or R&D activities that utilize any equipment or materials that have the potential to cause harm to personnel, property or the environment. For example, use of:

- Non-Nationally Recognized Testing Laboratory (NRTL) or modified listed electrical equipment including electronics.
- Materials that are potentially harmful to the environment or human health.
- Flammable materials.
- Moving components, unexpected startup of equipment.
- Lasers (class 3b or 4).
- Cryogens (in some cases, the ORC may consist solely of the cryogenic safety panel review).
- Pressure vessels and piping or vacuum vessels.
- Materials/processes capable of emitting radiation.

ES&H reviews are often required to verify personnel safety, protection of the environment and compliance with FEHSM, FRCM and the Engineering Manual. The Technical Appendix lists Fermilab standards that define required reviews. The ORC must include, by reference, any other applicable ES&H review requirements listed in the Technical Appendix. In some cases, specific parts of an activity may be covered by a "partial" Operational Readiness Clearance (pORC), which is procedurally the same as a "full" ORC. The pORC will allow testing or commissioning of a subsystem.

Divisions have the discretion to require ORCs per internal policies or at any time for any type of activity. Activities that have undergone an ORC review that cease operations for greater than 60 days or have been modified may require another ORC at the discretion of the DSO.

The ORC process is initiated by the Activity Owner through completing the appropriate online form (https://fermipoint.fnal.gov/service/tsworc). The Activity Owner must select *New ORC – with Beam* or *New ORC – No beam*. As the titles indicate, activities that will be installed at locations inside active beamline or detector enclosures must complete the *with beam* form. All other activities must complete the *no beam* form.

Create New *ORC with Beam* Form:
https://fermipoint.fnal.gov/service/tsworc/Lists/tsworc/NewForm.aspx?Source=/service/tsworc/&Beam=1&orc=1

Create New *ORC No Beam* Form:
https://fermipoint.fnal.gov/service/tsworc/Lists/tsworc/NewForm.aspx?Source=/service/tsworc/&Beam=0&orc=1

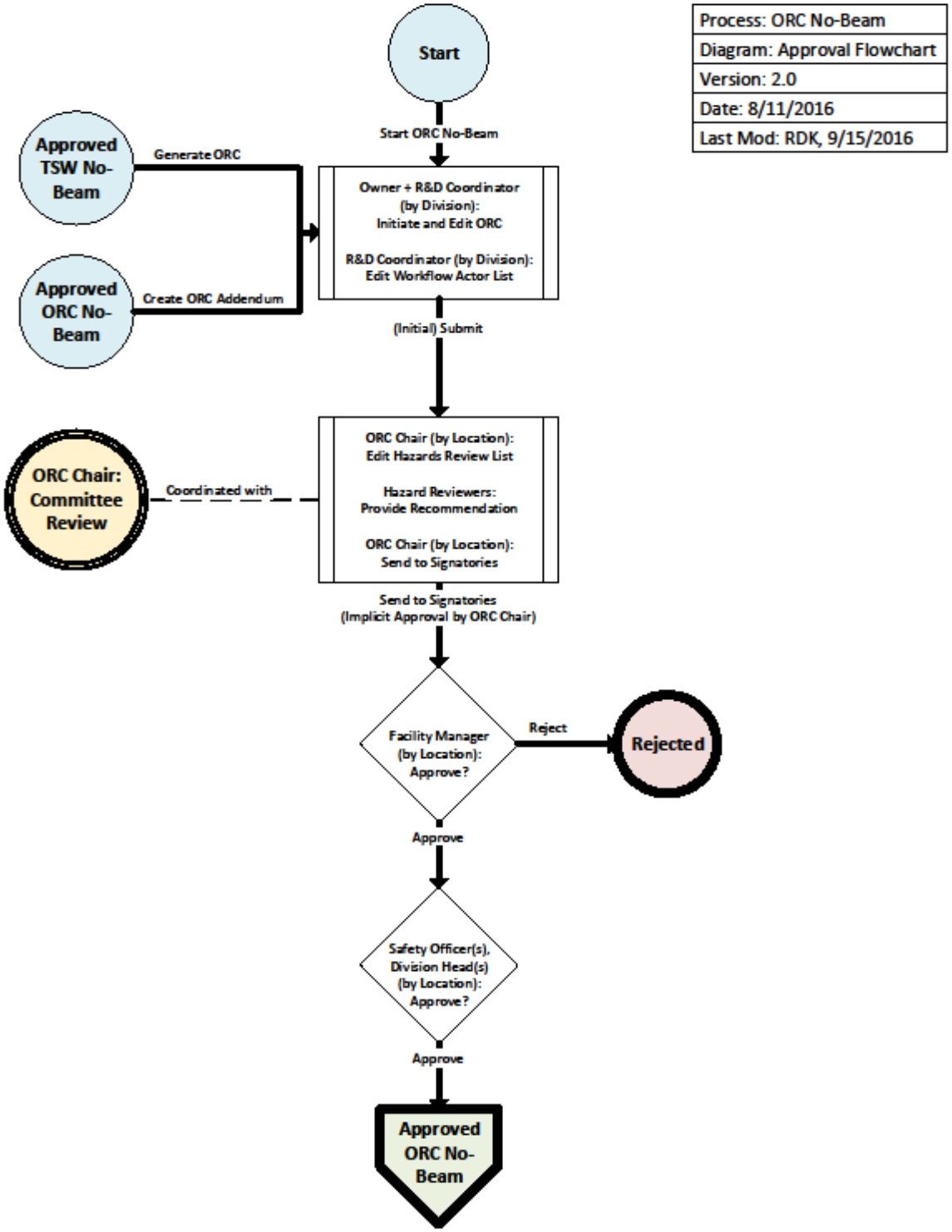
The ORC forms will guide activity owners through multiple tabs to provide information about the activity. Required information includes:

- Contact information for activity owner
- "Experiment" information – a general description and the purpose of the activity (experiment, test, R&D or other)
- Beam – if beam is required, be sure the correct form is completed
- Location – select the location of the activity
- Schedule – propose a time for the ORC review (day, time)
- Hazards – provide specific information for each identified hazard

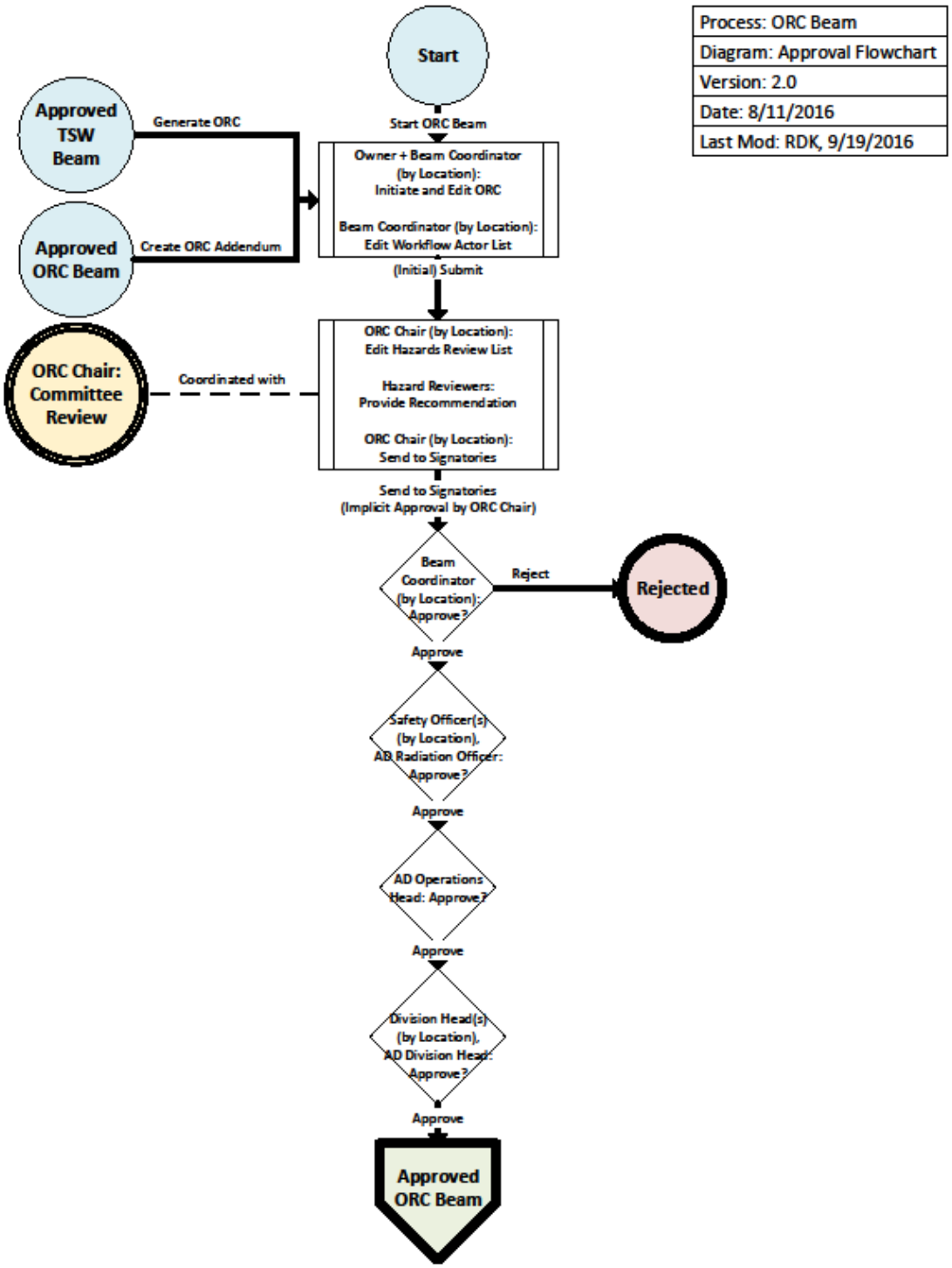
Once this information is submitted, the ORC Chairperson will be notified via email and will coordinate subject matter experts to review the activity, provide feedback and full or conditional approvals within the online form. The ORC Chairperson will ensure that any conditions for approval are satisfied and will recommend the activity for operation.

The online ORC forms automate the approval process. The ORC Chairperson's approval initiates the approval workflow (see below). The Activity Owner is notified by email when the ORC is approved and the operation may then proceed.

4.1 Figure 1 – *ORC <u>No Beam</u>* Approval Flow (*note: all approval steps that are negative result in rejection of the activity)*



4.2 Figure 2 – *ORC <u>with Beam</u>* Approval Flow (*note: all approval steps that are negative result in rejection of the activity)*



5.0 TECHNICAL APPENDIX

The following table contains other activities or equipment that may require system-specific ES&H review. Please see the reference document for more information and the process for review and approval. If an ORC is required, the ES&H review requirements listed in these references must be documented in the ORC review.

ESH Review Topic	**Reference**
Accelerator Readiness Review	FESHM 2010 – Planning & Review of Accelerator Facilities and their Operations (Work Smart Standard (WSS))
Accelerator Safety Envelope	FESHM 2010 – Planning & Review of Accelerator Facilities and their Operations (WSS)
Cryogenic Systems	FESHM 5032 – Cryogenic System Review FESHM 5032.1 – Liquid Nitrogen Dewar Installation & Operation Rules (WSS) FESHM 5032.2 – Liquid Cryogenic Targets (WSS)
Electronics	Electrical Design Standards for Electronics in Experimental Apparatus: ESHQ DocDB #2781 Electrical Safety ORC Review Guidelines: ESHQ DocDB #3270
Electrical Utilization Equipment	FESHM 9110 – Electrical Utilization Equipment Safety
Environmental Review	FESHM 8060 – National Environmental Policy Act Review Policy Environmental ORC Review Guidelines: ESHQ DocDB #3270
Fire Hazard Review	FESHM 6020.3 – Storage & Use of Flammable Gases (WSS) Fire/Life Safety ORC Review Guidelines: ESHQ DocDB #3270
Lasers	FESHM 4260 – Lasers
Oxygen Deficiency Hazard	FESHM 4240 – Oxygen Deficiency Hazards (ODH) (WSS)
Piping Systems	FESHM 5031.1 – Piping Systems (WSS)
Pressure Relief Systems	FESHM 5031.4 – Inspection & Testing of Relief Systems
Pressure Vessels	FESHM 5031 – Pressure Vessels FESHM 5034 – Pressure Vessel Testing FESHM 5031.5 – Low Pressure Vessels and Fluid Containment
Radiation Protection	FESHM 11000 – Radiation Safety Program
Shielding Assessments	FRCM Chapter 8 – Accelerator Shielding & Radioactivation
Vacuum Vessels	FESHM 5033 – Vacuum Vessels FESHM 5033.1 – Vacuum Window Safety (WSS)