



NOIRLab Safety Policy

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NOIRLab Safety Policy

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Purpose

This document provides the description of the National Optical-Infrared Astronomy Research Laboratory (NOIRLab) Safety Policy. The Policy focuses on personnel and equipment safety for all NOIRLab operations and projects. This policy addresses working conditions and procedures, as well as the management structure and design features that impact safety throughout NOIRLab operations.

1 Introduction

The management of National Center for Optical-Infrared Astronomy (NOIRLab) is committed to achieving the highest performance in safety, health, and environmental management practices with the aim of creating and maintaining a safe and healthy working and operating environment. The Safety Policy focuses on personnel and equipment safety throughout the sites of NOIRLab, inclusive of any new designs and construction activities. The policy addresses working conditions and procedures, as well as the management structure and design features that impact safety throughout NOIRLab.

This Safety Policy covers all NOIRLab efforts while recognizing and relying on existing Safety, Health, and Environment policies in place at participating institutions.

2 Objective

This Policy establishes and defines Safety, Health, and Environment (SHE) procedures and requirements for NOIRLab consistent with all United States and Chilean laws and regulations. The objective of the policy is to make safety, health, and environmental management an integral part of operations and construction activities.

In addition to the stated policies and requirements, this policy lays out a foundation during early NOIRLab development intended to establish a culture where the safety and health of personnel and equipment is a paramount concern, and that individuals are empowered and management is structured to encourage and promote safety in all activities and at all sites and activities of NOIRLab. In particular, NOIRLab is committed to

- promote a work environment based on continuous improvement, employee involvement, ownership, teamwork, education, and leadership;
- build self-esteem, empowerment, pride, enthusiasm, and optimism and encourage innovation;
- reinforce the need for people to care about the people they work with;
- promote the philosophy that safety is not a priority that can be reordered but instead is a value associated with everything we do;
- recognize, reward, and reinforce our safety, health, and environmental achievements, innovations, and behaviors;
- address all known risks to people, property, the environment and mission assurance, in addition to budget and schedule risks;

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- exercise vigilance to ensure compliance with all applicable, laws, regulations, and management best practices;
- integrate safety, health, and environmental considerations into operations and new project planning, design, and construction to minimize loss; and
- conduct sustainable programs to minimize pollution to the environment, to protect material resources, to honor cultural resources, and to minimize our impact to biota.

3 Overview

To realize these commitments, NOIRLab has established this policy based on clear lines of communication, clear procedures, critical review, personal responsibility, and accountability for safe planning, design, and conduct. This section provides an overview of the major elements in the NOIRLab Safety Policy. Each of these is further described later in this document and specifically addressed in detailed implementation documents.

3.1 Safety, Health, and Environmental (SHE) Plans

Guidelines for safe working conditions are found in the NOIRLab Safety, Health, and Environment (SHE) Plan. The SHE Plan is a critical element in the Safety Policy, and NOIRLab expects that each site, collaborating organization, and contractor has established safety programs that will govern the specific activities at that location. NOIRLab has a minimum expectation for the criteria established in the plan and expects all staff, whether permanent to the location or visiting, to follow the NOIRLab SHE plan and local procedures.

3.2 Safety Reviews and Hazard Analysis

NOIRLab will conduct periodic safety reviews focused on compliance to safety regulations, this policy, and good practices. The frequency of the reviews will be commensurate with the management plan. Reviews will be conducted by SHE professionals and will focus on specific subsystems of an observatory, the observatory as a whole, and this safety policy itself. Each subsystem will conduct periodic Hazard Analyses to be included in the reviews. Hazard Registers will be maintained in standard forms for cross observatory reviews.

3.3 Head of Safety and the Safety Council

NOIRLab Management team is responsible and held accountable for incorporating the safety policy, SHE plans, standards, rules, and principles into the work. To emphasize the commitment to safety, a single NOIRLab Head of Safety manages, executes, and verifies compliance to the Safety Policy. This safety professional is part of the management team, reports to the NOIRLab Director of Center Operations Services, and has direct access to the NOIRLab Director.

A Safety Council will be established and will consist of NOIRLab safety professionals and institutional members as determined by the NOIRLab Director, and the Head of SHE. The purpose of

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this safety council is to consult on safety, health, and environmental issues, provide policy advice, evaluate program effectiveness, and make recommendations to the NOIRLab Director. The Safety Council will meet at a minimum yearly or at appropriate intervals as required and determined by the Council, NOIRLab Director, and Head of SHE. The safety council is NOT a replacement for the mandated Chilean safety committees. NOIRLab also maintains a Safety website to communicate with the large distributed NOIRLab team and facilitate the dissemination of key information.

3.4 Safe Operations, New Design, and New Construction

NOIRLab will follow best practices for safe operations, new design, and construction and will comply with U.S. and Chilean laws and regulations. The Head of Safety, Health, and Environment, site safety professionals, and the Safety Council work with the directors, managers, and engineers to identify the US, Chilean, international, and agency institution codes and standards that should be applied to the various work conducted at NOIRLab.

4 NOIRLab Safety, Health and Environmental (SHE) Plan

All efforts to operate, design, construct, and commission at NOIRLab are to be performed within the jurisdiction of an institution with established Safety, Health, and Environment (SHE) policies and procedures. The SHE Plan provides the detailed definition of compliance standards, responsibilities, behavior, and reporting. All personnel will follow the guidelines established in the SHE plan. When traveling, personnel shall follow home institution travel policies. Personnel traveling on behalf of AURA shall refer to the AURA Travel web page for specific instructions. Procedures will be developed for new NOIRLab facilities as they are put into place and if custom procedures are necessary. In all cases, the SHE plan cover the details that mandate and inspire people to incorporate safe designs, to define safe procedures, and to work safely and responsibly together.

4.1 Compliance to Regulations, Codes, and Standards

Safety standards shall be standardized for all NOIRLab operations and sites, allowing for all staff members to be informed and to reduce confusion between sites. Safety standards include procedures for lock out, tag out, confined spaces, fall protection, and others.

NOIRLab expects local SHE procedures to comply with all applicable safety, health, and environment regulations and requirements in Title 29 of the U.S. Code of Federal Regulations (CFR) including part 1910, “OSHA Safety and Health Standards for General Industry,” Part 1926, “Safety and Health Regulations for Construction,” 49 CFR Federal Motor Carrier Safety Administration, 40 CFR Protection of Environment, and others that may apply. NOIRLab considers the above CFRs as minimum standards. Procedures governing work in Chile will comply with the requirements of this document and other Chilean laws such as Safety Law No 16.744 and other Chilean Standards (Normas Chilenas).

4.2 Other Agency Safety, Health, and Environmental Plans and Responsibilities

Work conducted at participating organizations (DOE, universities, or contractors) shall be governed by the local SHE plan. These plans include identification of the local Safety Manager/Coordinator and lines of authority to which all personnel working with NOIRLab activities at that location shall adhere. There shall be no ambiguity about which plans govern activity for visiting staff. Local SHE plans take precedence over home institution regulations except where the employee is further restricted. Staff members who recognize inconsistencies in the local plans and their home institution policies shall identify the situation to the local safety authority, the home institution safety authority, and the NOIRLab Head of Safety, Health, and Environment to resolve any conflicts.

4.3 SHE Plan Expectations

NOIRLab has a set of guidelines expected from the local SHE plan. The Head of Safety and NOIRLab management will work with the collaborating institutions to insure that the local plans meet expectations. The Head of Safety is charged with the review of the local plans to see that NOIRLab expectations are met, that all elements (documentation) are available to the staff, and that issues of nomenclature and document titles are reconciled where differences are identified. The following topics are expected to be addressed in local SHE plans:

- Local Safety Manager/Coordinator
- Staff Responsibilities
- Visitor and Access Policy
- Behavioral Policies
- Personal Protection Equipment
- Hazardous Material Management
- Emergency Contacts and Procedures
- Special Equipment Procedures (laser, etc.)
- Utility use and servicing (cryogenics, gases, power etc.)
- Lock-out processes
- Inspections
- Housekeeping
- Reporting and Records

4.4 Contractor Safety, Health, and Environment Plans

All institutions and contractors that perform work for NOIRLab are required to develop, submit, and implement a project- and site-specific safety, health, and environment management plan. The plan must extend to its own employees, site employees, other workers, and members of the public. The contractor is also required to ensure compliance with the plan. The details of the contractor

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requirements are subject to specific policies from the specific NOIRLab location contracting the work but are expected to address the same information as described in Section 4.3 above.

For work contracted at NOIRLab-specific locations, the contractor's safety record and ongoing safety program will be an important element in the selection criteria. All contractors are required to complete the "Safety and Health Questionnaire for Contractors" (as maintained by AURA Procurement) that will be used to evaluate potential contract employers. All general contractors shall require subcontractors to comply with the contractor's Safety, Health and Environment Plan. The Safety and Health Questionnaire for Contractors will be provided to potential contractors during the proposal process and shall be completed and submitted with the contractor proposal documents. The questionnaire will be used by NOIRLab management to assess contractors' safety performance and programs and will be used during the selection process.

4.5 SHE Plan Availability to Personnel

NOIRLab maintains a Safety Program website (<https://NOIRLab.edu/safety/home/fake>) that includes links to all applicable SHE policy, plans, standards, and procedures to facilitate convenient access to the information to everyone working on NOIRLab tasks. This is particularly important for staff who visit and work at other institutions where access to the information is not routine. The NOIRLab Head of Health, Safety, and Environment is charged with establishing the links to the appropriate and applicable information for each participating institution.

5 Safety Reviews and Hazard Analysis

Formal safety reviews and hazard analyses will be the principal elements of the NOIRLab system safety engineering and analysis methodology.

5.1 Safety Reviews

NOIRLab will conduct periodic reviews focused on compliance to the Safety Policy, SHE Plan, applicable standards, and procedures for operations, design, and construction. The frequency of the reviews will be commensurate with the NOIRLab directorate expectations. Reviews will be led by the Head of Health, Safety, and Environment with support from other safety professionals. They will focus on specific subsystems of the observatory, contracted efforts, the observatory as a whole, and the Safety Policy itself. Each subsystem will conduct periodic risk assessment and hazard analyses to be included in the reviews. Contractor hazard analysis will also be reviewed consistent with deliverables established in contract documents. Location safety reviews will be conducted at a minimum yearly, while other reviews and their scope will be determined by the directorate or local management for design reviews.

A key element of the safety review process is the assessment of hardware designs, construction, and operational processes; hazard analysis results; and the interaction with the NOIRLab Risk Management Plan. There are three types of risks: 1) Technical Risk, consisting of the risk of not meeting performance requirements; 2) Programmatic Risk, consisting of the risk of failure due to cost

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or schedule overruns; and 3) Risk of Harm, consisting of the risk to personnel and equipment safety. The NOIRLab Risk Management Plan focuses on items 1 and 2, and this Safety Policy focuses on item 3. There are interdependencies that are managed within system engineering and the safety review process.

5.2 Hazard Analysis and Hazard Register

NOIRLab utilizes a formal hazard analysis process to identify, analyze, and determine the resolution of hazards. This hazard resolution method consists of the series of analytic steps summarized below and described fully in the NOIRLab Hazard Analysis Plan.

- Define the physical and functional characteristics of a proposed design or new installation by employing the information available (design documents, operating procedures, etc.) and relating the interaction between people, procedures, equipment, and the environment.
- Identify known hazards related to all aspects of the proposed design and determine their causes.
- Assess the hazards to determine severity and probability and to recommend means for their elimination or control.
- Implement corrective measures to eliminate or control the individual hazards, or accept the corresponding risks.
- Conduct follow-up analyses to determine the effectiveness of preventive measures, address new or unexpected hazards, and issue additional recommendations if necessary.

6 Safety Policy Management and Responsibilities

This safety policy requires a clear line of responsibility and authority to ensure proper implementation and verification. The NOIRLab director will appoint a Head of Safety for the organization to manage all aspects of the safety program. The Head of Safety is assisted by a standing council, comprised of safety professionals and other team members, to provide the review and assessment required within the program and to support the Head of Safety as needed. This section provides the roles and responsibilities for the key NOIRLab staff regarding the safety program.

6.1 NOIRLab Head of SHE (Safety)

The Head of Safety, Health, and Environment is responsible for the NOIRLab Safety Policy, its implementation and helping management to ensure compliance. The Head of Safety reports directly to the NOIRLab Director of Center Operations Services and works closely with managers, systems engineers, and the local safety managers/coordinators at each participating organization responsible for the implementation of local Safety, Health, and Environment Program (SHE) plans. The Head of Safety, Health, and Environment has the authority and responsibility to report safety, health, and environment issues and to make recommendations to the Director of Center Operations Services, the Safety Council, and other leadership of NOIRLab, reporting directly to the NOIRLab director if necessary. The Head of Safety, Health, and Environment inspires staff members to value safety and manage all risks in their area of responsibility.

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The Head of Safety, Health, and Environment leads the effort to establish, plan, organize, and integrate this Safety Policy into NOIRLab as well as influence new designs when necessary. The Head of Safety, working with the NOIRLab and institutional Safety Managers/Coordinators, will be actively involved in many if not all aspects of NOIRLab. They are responsible for

- participating in design reviews;
- preparing the Safety Program deliverable documents;
- supporting the program level interface with NSF, DOE (when applicable), and others;
- developing and establishing safety design criteria and safety design requirements as needed;
- reviewing and approving selected drawings, specifications, and procedures;
- participating in hazardous testing if required;
- evaluating design changes for their impact on safety, health, or the environment;
- coordinating and verifying adequate emergency response systems and procedures; and
- coordinating safety, health, and environment activities that are needed.

The NOIRLab Head of Safety, Health, and Environment and local safety managers/coordinators are all obligated to keep current with all laws, ordinances, statutes, rules, and regulations as they become promulgated.

6.2 NOIRLab Director

The NOIRLab Director has the overall responsibility for ensuring that SHE management practices are incorporated into the organization. The NOIRLab director works with the Director of Center Operations Services and the Head of Safety, Health, and Environment to implement the safety policy and plan and other SHE objectives by

- ensuring the Safety Policy is established and integrated throughout NOIRLab;
- ensuring that known risks and hazards are identified, eliminated, or controlled within established program risk acceptability parameters; and
- ensuring that operations are performed in accordance with applicable safety requirements, and applicable governmental safety regulations.

6.3 NOIRLab Director of Center Operations Services

The NOIRLab Director of Center Operations Services has the day-to-day responsibility for ensuring that SHE management practices are incorporated into NOIRLab. The Director of Center Operations Services will implement the Safety Policy through the appointment of the Head of Safety, Health, and Environment and will direct all managers to keep SHE issues a priority in all aspects of the organization. Specifically, the Director of Center Operations Services and managers will

- make SHE considerations a part of all planning processes by identifying known hazards, determining what standards apply, implementing controls, determining the competencies required to do the work safely, and assuring that each of these elements are in place before work is authorized to proceed;

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- ensure management focuses on safe accomplishments of the mission, understanding assignments and carrying out the core safety management functions correctly and efficiently. These principles are dependent both upon management commitment and employee/individual involvement and accountability;
- ensure the Safety Policy and the SHE Plan is established and integrated throughout the organization;
- ensure that known hazards are identified, eliminated, or controlled within established program risk acceptability parameters;
- ensure that operations and construction work are performed in accordance with applicable safety requirements and applicable governmental safety regulations;
- review and approve safety analysis and safety documents; and
- ensure that necessary documents are submitted to governmental agencies that require them.

6.4 Staff Members

Each member of the NOIRLab staff is responsible for integrating safety into their work and supporting the SHE Policy, SHE Plan, Safety Standards, and procedures as established for the work location. All staff are encouraged and empowered to understand the work environment and identify designs, procedures, and conditions that they consider unsafe, whether specifically addressed in SHE plans or otherwise occurring. Every staff member has the authority, without fear of reprimand or penalty, to stop work and seek technical assistance from the Safety staff for guidance, resolution of safety issues or disputes involving the work or business activity.

7 Design for Safe Development and Operation

NOIRLab will follow operational, design, and construction best practices and comply with the appropriate laws and standards in all aspects of the observatory system. NOIRLab is a technically and geographically diverse observatory that falls under many categories and jurisdictions of safety standards. This diversity, and the one-of-a-kind nature of the facilities, requires that the directors, safety staff, managers, engineers, technicians, and administrative staff work closely to apply the correct safety standard to the different operational processes and design considerations. In all cases, operations and designs will be consistent with applicable standards from U.S., Chilean, International and agency institutions, including the following.

- U.S. Occupational Safety and Health Administration (OSHA)
- Environmental Protection Agency (EPA)
- National Fire Protection Association (NFPA)
- International Code Council (ICC)
- Chilean Regulations, Codes and Standards
- Department of Energy National Laboratories (depending on collaboration agreements)

The coordination between the Head of Safety, Health, and Environment and engineering staff will be driven by system requirements and the review and Hazard Analysis processes described in this

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document. One objective of these processes is to keep the Head of Safety, Health, and Environment safety managers and coordinators, and the Safety Council involved in operational and design processes. The design for safety will include the intrinsic design, the manufacturing and construction process, and resulting operational concepts. As operating procedures are developed for a particular location, project, installation, or new process, Job Hazard Analysis will be included to protect people, equipment, and processes from known hazards in a stand along Job Hazard Analysis or incorporated in engineering procedures.

Glossary

SHE	Safety, Health, and Environment
CFR	Code of Federal Regulations
DOE	Department of Energy
OSHA	U.S. Occupational Safety and Health Administration
EPA	Environmental Protection Agency
NFPA	National Fire Protection Association
ICC	International Code Council