

## Work Planning and Control Procedure

Physics Division Procedure PHY-PROC-2, Rev 2

Effective Date: 04/01/2017

---

### 1 Purpose

Establish the process used by the Physics Division to implement work planning and control as per the criteria set forth in LMS-PROC-200.

### 2 Scope

This procedure applies to the following Physics Division activities and entities.

LMS core processes:	RD&E
Organizations:	Physics Division
Buildings:	all Physics Division locations
Specific locations:	all Physics Division locations
Other applicability factors:	ATLAS Operating Procedures are governed by the reviewed and approved ATLAS Safety Analysis Document. Work performed by ATLAS users is covered by the ATLAS User Agreement.
Exclusions from the above criteria:	None

### 3 Work Process

#### 3.1 Introduction

This procedure details how the Physics Division implements LMS-PROC-200. During the planning and execution of work, the Physics Division must reduce risk to an acceptable level that protects workers, the public, the environment, and the Laboratory. Risk is reduced by:

- Complying with Argonne Laboratory Management System (LMS) requirements.
- Complying with local policies and procedures.
- Screening for hazards, and identifying and implementing controls to mitigate those hazards.

This procedure describes the process by which the Physics Division:

- Incorporates the results of hazards analysis and implementing controls into its work.
- Provides for derivative work control documents (such as field documents) to assist workers in work execution.
- Requires that personnel have the competence necessary to carry out assigned responsibilities.
- The approach to accomplishing WPC is graded based on the risk and complexity of work.

---

**The current version of this procedure resides at <http://www.phy.anl.gov/division/esh/index.html>  
Printed or electronically downloaded copies may be obsolete. Before using such a copy for work direction, employees must verify that it is current by comparing its revision number to that shown in the on-line version.**

## Work Planning and Control Procedure

Physics Division Procedure PHY-PROC-2, Rev 2

Effective Date: 04/01/2017

- Office work is considered low risk and falls outside the requirements of this procedure. All office work will be done in accordance with PROC-204.

### 3.2 Step-by-Step Procedure

#### 3.2.1 Classification Determination

The steps below are mandatory unless noted otherwise.

Step	Job Role	Action
1	Responsible manager, supervisor or worker(s) performing the work.	<ul style="list-style-type: none"> <li>• Determine the classification of the work to be performed by using the tool available in <i>LMS-PROC-200, Table B-1</i> (See Appendix A) to determine rigor level:               <ul style="list-style-type: none"> <li>○ If Skill of the Worker, proceed to Step 2                   <ul style="list-style-type: none"> <li>• Note: Skill of the Worker may be used only if the rigor of the task is determined to be Low or Medium.</li> </ul> </li> <li>○ If Procedure Driven, proceed to Step 3</li> <li>○ If Task Driven, proceed to Step 3.</li> </ul> </li> </ul>
2	Responsible manager or supervisor.	<ul style="list-style-type: none"> <li>• After verifying that the task may be done using Skill of the Worker, either perform the task (must be qualified) or select and assign workers known to be qualified to perform the work. For additional details in determining qualification of worker, see Exhibit E1.</li> </ul>

**Work Planning and Control Procedure**

Physics Division Procedure PHY-PROC-2, Rev 2

Effective Date: 04/01/2017

3	Responsible manager or supervisor.	<ul style="list-style-type: none"> <li>• Use an existing appropriate procedure, or if none exists have a procedure created, reviewed, approved, and authorized. Insure that the procedure fully covers the scope of the work being proposed. The scope must be written to the detail needed to insure that all hazards involved in the work are identified, evaluated and able to be controlled.</li> <li>• In either case the procedure may be detailed as part of a work control document using the <a href="#">web based-application</a> or attached to a new work control document created using the web based-application. <i>NOTE: ATLAS Operating Procedures are governed by the currently approved ATLAS SAD, which establishes the safety envelope for routine work at the ATLAS Accelerator Facility and contains the complete Hazard Analysis for these procedures. This Analysis is equivalent to the Hazard Analysis required by PROC-200. ATLAS Operating Procedures will be incorporated into the web-based WPC system when next reviewed.</i></li> </ul>
3 (cont.)	Responsible manager or supervisor.	<ul style="list-style-type: none"> <li>• At a minimum, the work control document must include: <ul style="list-style-type: none"> <li>○ Definition of the scope of work and limits for the work that will be authorized (<a href="#">see LMS-PROC-200 Exhibit Section B.2</a>).</li> <li>○ Identification of the hazards and all controls (<a href="#">see LMS-PROC-200 Exhibit Section B.3</a>).</li> <li>○ Additional requirements that must be satisfied for work authorization.</li> </ul> </li> <li>• Verify that the work control document is current and has been reviewed within the past year. If it has not been reviewed, insure it receives the appropriate review and seek clarification if needed.</li> </ul>
4	Worker	<ul style="list-style-type: none"> <li>• Review the work package and acknowledge their understanding of the work and its associated hazards and controls by either: <ul style="list-style-type: none"> <li>○ Electronically signing the work package's <a href="#">work authorization document</a>, or</li> <li>○ Signing the hard copy of the work package.</li> </ul> </li> </ul>

---

The current version of this procedure resides at <http://www.phy.anl.gov/division/esh/index.html>  
Printed or electronically downloaded copies may be obsolete. Before using such a copy for work direction, employees must verify that it is current by comparing its revision number to that shown in the on-line version.

**Work Planning and Control Procedure**

Physics Division Procedure PHY-PROC-2, Rev 2

Effective Date: 04/01/2017

5	ESH coordinator or designee.	<ul style="list-style-type: none"> <li>Review the procedures to insure that all safety considerations are fully identified and controlled.</li> <li>Review the procedures, results of hazards analysis and identification of controls and permit requirements to insure they are not in conflict.</li> </ul>
---	------------------------------	--

**3.2.2****Perform Work**

The steps below are mandatory unless noted otherwise.

Step	Job Role	Action																																
1	Responsible manager or supervisor.	<ol style="list-style-type: none"> <li>Insure the work will be performed by or supervised by qualified personnel with the resources required to accomplish the task.</li> <li>Low and Medium rigor work is approved by the cognizant group leader, or safety committee when necessary. The cognizant group leader or Division Director will authorize the work.</li> <li>High rigor work will be approved by a safety committee and authorized by the Division Director.</li> </ol> <table border="1" data-bbox="581 1031 1295 1276"> <thead> <tr> <th colspan="4">Approval Authority</th> </tr> <tr> <th></th> <th>Low Rigor</th> <th>Medium Rigor</th> <th>High Rigor</th> </tr> </thead> <tbody> <tr> <td>Group Leader (or designee)</td> <td>YES</td> <td>YES</td> <td>NO</td> </tr> <tr> <td>Safety Committee (or designee)</td> <td>YES</td> <td>YES</td> <td>YES</td> </tr> </tbody> </table> <table border="1" data-bbox="581 1329 1295 1570"> <thead> <tr> <th colspan="4">Authorization Authority</th> </tr> <tr> <th></th> <th>Low Rigor</th> <th>Medium Rigor</th> <th>High Rigor</th> </tr> </thead> <tbody> <tr> <td>Group Leader (or designee)</td> <td>YES</td> <td>YES</td> <td>NO</td> </tr> <tr> <td>Division Director (or designee)</td> <td>YES</td> <td>YES</td> <td>YES</td> </tr> </tbody> </table>	Approval Authority					Low Rigor	Medium Rigor	High Rigor	Group Leader (or designee)	YES	YES	NO	Safety Committee (or designee)	YES	YES	YES	Authorization Authority					Low Rigor	Medium Rigor	High Rigor	Group Leader (or designee)	YES	YES	NO	Division Director (or designee)	YES	YES	YES
Approval Authority																																		
	Low Rigor	Medium Rigor	High Rigor																															
Group Leader (or designee)	YES	YES	NO																															
Safety Committee (or designee)	YES	YES	YES																															
Authorization Authority																																		
	Low Rigor	Medium Rigor	High Rigor																															
Group Leader (or designee)	YES	YES	NO																															
Division Director (or designee)	YES	YES	YES																															
2	Worker(s)	<ul style="list-style-type: none"> <li>Perform the work either using Skill of the Worker or following the written procedure, as applicable (See Section 3.2.1, Step 3 above.) Workers are required to stop or suspend work when conditions change or they recognize that the work is outside the scope limits.</li> </ul>																																

The current version of this procedure resides at <http://www.phy.anl.gov/division/esh/index.html>  
 Printed or electronically downloaded copies may be obsolete. Before using such a copy for work direction, employees must verify that it is current by comparing its revision number to that shown in the on-line version.

## Work Planning and Control Procedure

Physics Division Procedure PHY-PROC-2, Rev 2

Effective Date: 04/01/2017

### 3.2.3 Feedback and Improvement

The steps below are mandatory unless noted otherwise.

Step	Job Role	Action
1	Worker(s)	<ul style="list-style-type: none"> <li>It is important to provide feedback to the Responsible Manager concerning the adequacy and accuracy of the WPC document and any suggested changes concerning either the present or future tasks. This feedback can take one of several forms, for instance a discussion during group meetings or a conversation with the Responsible Manager either during or after the performance of a task.</li> </ul>

### 3.2.4 Changes in Work Plan

The steps below are mandatory unless noted otherwise.

Step	Job Role	Action
1	Responsible manager or supervisor.	<p>If changes to the work plan are found to be necessary share that information with the affected party(s) (such as workers, supervisors or manager). One of those parties must be the person responsible for the work plan. That person must then make any required changes before the work continues or the work plan is next used.</p> <p>Re-approval and re-authorization are required when change to the scope, scope limits, hazards or controls are made.</p> <p>Editorial changes that do not change the scope, scope limits, hazards or controls do not need to be re-approved and re-authorized.</p>

The current version of this procedure resides at <http://www.phy.anl.gov/division/esh/index.html>  
 Printed or electronically downloaded copies may be obsolete. Before using such a copy for work direction, employees must verify that it is current by comparing its revision number to that shown in the on-line version.

## Work Planning and Control Procedure

Physics Division Procedure PHY-PROC-2, Rev 2

Effective Date: 04/01/2017

### 3.2.5 Performing Annual Review/Reaffirmation of Work Package

The steps below are mandatory unless noted otherwise.

Step	Job Role	Action
1	Responsible manager	Unless it has been previously closed out, review the Work Package one year from the date it was authorized (plus or minus one month.) If necessary consult with any workers performing work under the Work Package and make any changes found to be necessary or desirable. Re-approve and re-authorize the Work Package if still necessary. If the Work Package is not re-approved, it automatically expires.

## 4

This procedure implements requirements established by the following basis documents.

CFR Title 10 Part 851

CFR Title 10 Part 830

U.S. DOE, Contract DE-AC02-06CH11357 with UChicago Argonne, LLC, Clause I.105 – DEAR 970.5223-1 Integration of Environment, Safety, and Health into Work Planning and Execution (Dec 2000).

U.S. DOE, Contract DE-AC02-06CH11357 with UChicago Argonne, LLC, Clause I.98 – DEAR 970.5204-3 Access to and Ownership of Records (Jul 2005).

U.S. DOE, Safety Management System, policy 450.4A.

U.S. DOE, National Environmental Policy Act Compliance Program, directive O 451.1B.

This procedure implements requirements established by the following Argonne policies.

*Environmental Policy*, LMS-POL-2.

*Safety and Health*, LMS-POL-1.

*Work Planning and Control*, LMS-POL-16.

This procedure implements requirements established by the following Argonne procedures.

*Office Safety*, LMS-PROC-204

*Local Work Planning and Control Procedures*, LMS-PROC-200

The following documents provide background information relevant to the subject of this procedure.

U.S. DOE, Integrated Safety Management System Guide (Volume 1) for use with Safety Management System Policies (DOE P 450.4, DOE P 450.5, and DOE P 450.6); the Functions, Responsibilities, and Authorities Manual; and the DOE Acquisition Regulation, DOE G 450.4-1B.

*Argonne National Laboratory Worker Safety and Health Program.*

*Argonne National Laboratory Integrated Safety Management System Description.*

---

The current version of this procedure resides at <http://www.phy.anl.gov/division/esh/index.html>  
 Printed or electronically downloaded copies may be obsolete. Before using such a copy for work direction, employees must verify that it is current by comparing its revision number to that shown in the on-line version.

**Work Planning and Control Procedure**  
 Physics Division Procedure PHY-PROC-2, Rev 2  
 Effective Date: 04/01/2017

---

## 5 Definitions

Term	Definition and Source
Responsible manager	A line manager responsible for the work being performed.
Responsible supervisor	A supervisor responsible for the work being performed.
Rigor	The formality of work control, including documentation and execution, based on the complexity of the work and the related safety consequences.

## 6 About this Procedure

Issuing LMS core process:	RD&E
LMS subprocess:	not applicable
Issuing organization:	Physics Division
Final approver:	Division Director
Subject matter expert:	Thomas Mullen
Review cycle (months):	36
Date last revised:	December 7, 2012
Date last reviewed:	December 7, 2012

## 7 Summary of Changes in This Version

- This version of the procedure adds a description of the contents to be included in work control documents and modifies the extent of documentation to include how workers acknowledge their understanding of the work and its associated hazards and controls.

---

**The current version of this procedure resides at <http://www.phy.anl.gov/division/esh/index.html>  
 Printed or electronically downloaded copies may be obsolete. Before using such a copy for work direction, employees must verify that it is current by comparing its revision number to that shown in the on-line version.**

**Work Planning and Control Procedure**  
Physics Division Procedure PHY-PROC-2, Rev 2  
Effective Date: 04/01/2017

---

**Exhibit: Supplement to WPC Local Procedure**

**E.1 A Guide to the Manager's Selection of Personnel to Perform Work**

*The responsible manager must select workers that have the requisite proficiency necessary to accomplish work described in a work package safely. Knowledge, understanding, and practical hands on experience are crucial to determining skills of an individual. If something unexpected occurs, there is a risk of safety failure. Understanding the "why" of an activity exposes the larger concepts of limitations and scope of work, allowing for mitigation, or identifying another course of action.*

*Skills are acquired in many ways. Formal training is an important aspect of acquiring expertise through courses, workshops, apprenticeships, independent undergraduate research, graduate research, and/or postdoctoral research. Argonne-specific training is acquired through use of the eJHQ system. Knowledge gained through self-training and practical experience is also considered.*

*Responsible managers should consider the following in their selection of workers:*

- *What are the skills required for the work?*
- *How were the worker's skills acquired?*
- *Are the worker's breadth and depth of knowledge and understanding appropriate to what will be considered routine in carrying out the work? Is detail sufficient, or are references sufficient, to permit an evaluation?*
- *Does the worker have practical (field) experience? If not, do other workers involved have the experience necessary to provide guidance to less experienced workers?*
- *Is the depth of the practical (field) experience commensurate with the scope of work?*
- *What is the worker's safety record, and has the person been involved in any work-related incidents? What are the safety records of workers he/she has supervised?*
- *Does the person demonstrate safety awareness?*



**APPENDIX A**  
**LMS-PROC-200 TABLES**

**Table B-1: Guidance for Local Organizations on Determination of WPC Rigor**

Consequence	
Complexity	Consequence
	Minimal
	Moderate
	Serious
	Major
<b>Difficult</b>	M
<b>Moderate</b>	L
<b>Simple</b>	L
H = high rigor; M = medium rigor; L = low rigor	
Complexity Determination	
<b>Difficult</b>	Requires: high mental awareness while performing task, extensive coordination with individuals and/or organizations, or emergency standby personnel required. Work area conditions expected to vary considerably at times. Potential for unanalyzed hazards requiring evaluation as work progresses (for example, uncharacterized changing exposure levels or unbounded fluctuations in magnitude of the hazard).
<b>Moderate</b>	Requires: support personnel to assist in performing work, careful coordination with individuals, or scheduling of resources outside of performing organization. Work may be first performance for the performing organization. Magnitude of hazards not fully realized until after work commences. Minor changes in work area conditions. Situations where two known hazards could interact to produce an additional hazard.
<b>Simple</b>	Requires: normal level of mental awareness, minimal coordination outside of the performing organization. Work area conditions stable. Hazards are readily recognizable and the magnitude (for example, voltage, exposure level, chemical reaction, amount of energy) of each hazard is known in advance.
Consequence Determination	
<b>Major</b>	Death, uncontrolled exposure to the public, off-site environmental release, or a site-wide emergency may result.
<b>Serious</b>	Severe injuries, hospitalization, on-site environmental release, or damage to system or process affecting reliability resulting in significant work stoppage. Consequence is limited to a single area (area may consist of multiple facilities or buildings).
<b>Moderate</b>	Serious ESH impacts or damage to system or process. Injuries without need for hospitalization. Consequence is limited to a single facility or building.
<b>Minimal</b>	Minor ESH impacts, impairment of the reliability for a system or process, or minor first aid cases. Consequence is limited to a room or small area outside of a facility.

The current version of this procedure resides at <http://www.phy.anl.gov/division/esh/index.html>  
 Printed or electronically downloaded copies may be obsolete. Before using such a copy for work direction, employees must verify that it is current by comparing its revision number to that shown in the on-line version.

**Work Planning and Control Procedure**

Physics Division Procedure PHY-PROC-2, Rev 1

Effective Date: 02/09/2017

**Table B-2: Rigor Level Examples**

<b>Low Rigor</b>
<ul style="list-style-type: none"> <li>• Routine office-type tasks</li> <li>• Routine activities in controlled areas and radioactive material areas</li> <li>• Equipment (bench top set-up) utilizing non-powered hand tools</li> <li>• Indoor operation of Class 1, Class 2, or Class 3R lasers</li> <li>• Trouble-shooting circuits less than 50 Volts (V)</li> <li>• Hazardous energy controlled by plug and cord electrical connection disconnected, no capacitors</li> <li>• Using an approved/ permitted air emission source</li> <li>• Using ladder &lt; 4 feet above surface</li> <li>• No impact on structures, systems, or components addressed in safety analysis-type document</li> <li>• Use of compressed air for operations such as painting, cleaning, maintaining tire pressure, etc.</li> <li>• Gas cylinder handling and change-outs or routine cryogen dewar fill/use applications</li> <li>• Use of standard utilities such as compressed dry air, cooling water, “house” supplied gases (nitrogen), etc., connected to laboratory equipment</li> <li>• Use of laboratory equipment within the normal operational design intent as documented in the system data package and/or the manufacturer’s manual</li> <li>• Entering a non-permit confined space, when the task will not affect classification of the space</li> <li>• Equipment calibration, deenergized, utilizing hand tools</li> </ul>
<b>Medium Rigor</b>
<ul style="list-style-type: none"> <li>• Use of hazardous chemicals, including particularly hazardous substances</li> <li>• Radiological activities that require a radiological work permit (RWP)</li> <li>• Open flame or spark-producing work requiring permit</li> <li>• Zero energy verification measurements (high likelihood of deenergized state)</li> <li>• Single source lockout/tagout (LOTO) capable of being easily isolated; no disassembly required</li> <li>• Low voltage calibration &lt; 50 V</li> <li>• Using ladder &gt; 4 feet above surface</li> <li>• Man-lift, bucket truck, or similar motorized lifts, with fall protection gear</li> <li>• Handling load configurations that adversely affect forklift/lift truck stability and maneuverability</li> <li>• Installation/ fabrication of new, or modification of an existing, pressure/vacuum system</li> <li>• Installation of new equipment not previously used that will be connected to standard utilities</li> <li>• Working in heavy traffic area</li> <li>• Heat/cold stress managed only by stay time and clothing</li> <li>• Hazardous waste cleanup operations</li> <li>• Hazardous waste operations at treatment, storage, and disposal facilities</li> <li>• Use of chemicals that are above a consumer commodity quantity</li> <li>• Controlling special processes that affect the quality of items and/or services</li> <li>• Work with unbound engineered nano particles</li> <li>• Unanalyzed high noise level expected to exceed threshold limit value</li> <li>• Quality requirements that impose stringent controls and documentation of completed activities</li> <li>• Machining operations that could result in severe injury to individuals, such as crushed fingers or hands, amputations, lacerations, blunt force trauma, or other potentially severe injuries.</li> </ul>

(continued)

The current version of this procedure resides at <http://www.phy.anl.gov/division/esh/index.html>  
 Printed or electronically downloaded copies may be obsolete. Before using such a copy for work direction, employees must verify that it is current by comparing its revision number to that shown in the on-line version.

**Work Planning and Control Procedure**

Physics Division Procedure PHY-PROC-2, Rev 1

Effective Date: 02/09/2017

**Table B-2: Rigor Level Examples (cont.)**

<b>High Rigor</b>
<ul style="list-style-type: none"> <li>• Operating, aligning, or servicing openly accessible or exposed Class 3B or Class 4 laser beams</li> <li>• Outdoor operation of any class of visible laser (400 – 700nm) or any Class 3B or Class 4 laser</li> <li>• Working at heights requiring a fall protection plan</li> <li>• Work with toxic gases such as metal hydrides or corrosives</li> <li>• Handling of pyrophoric materials, including those suspended in liquids, with particle size small enough to support spontaneous combustion</li> <li>• Permit required confined space entry</li> <li>• Energized electrical work &gt; 50 V</li> <li>• Use of primary explosive material and/or use of low energy electro-explosive devices</li> <li>• Work on equipment or processes involving multiple types of hazardous energy sources requiring LOTO</li> <li>• Work within &lt; 10 ft of an overhead power line &gt; 50 kV, including equipment movement underneath, excluding work by high voltage linemen</li> <li>• Work in a Very High Radiation Area</li> <li>• Excavation of wall, floor, or ceiling penetration where a site investigation has not or cannot identify all potential hidden hazards</li> <li>• Excavation that includes digging with power equipment to a depth of eight inches or more that might contact underground utilities or when an employee must enter an excavation five feet or more in depth</li> <li>• Entry into environments with potential imminent danger to life or health, including work that may activate chemical deluge systems</li> </ul>

The current version of this procedure resides at <http://www.phy.anl.gov/division/esh/index.html>  
 Printed or electronically downloaded copies may be obsolete. Before using such a copy for work direction, employees must verify that it is current by comparing its revision number to that shown in the on-line version.