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Conduct of Operations		Effective Date: August 7, 2015	<b>Initiated by:</b> Associate Director, Engineering and Infrastructure Department
		<b>Supersedes:</b> April 18, 2012	Approved: Director

Management System (Primary): 03.00 Engineering

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Management System Owner:	Associate Laboratory Director for Engineering and Infrastructure
Management Process:	03.07 Conduct of Operations
Process Owner:	Associate Laboratory Director for Engineering and Infrastructure
Subject Matter Experts (SME):	Associate Laboratory Director for Engineering and Infrastructure;
	Head, Project Management

# **Applicability**

This procedure is applicable to all PPPL sites and operations.

### **Scope**

In accordance with PPPL policy P-006, Conduct of Operations, and PPPL's Integrated Safety Management System Description, this procedure describes the implementation of PPPL's Conduct of Operations Program. The program is based on the 18 specific requirements of Attachment 2 of DOE Order 422.1 (successor to DOE Order 5480.19) being implemented on a project by project basis using a graded approach based on the size, complexity, hazards and consequences of operations.

The 18 requirements of the DOE order are delineated in this procedure in Attachment I. PPPL implements 6 specific requirements on a Lab-wide basis, covering all Laboratory personnel, programs and projects. These Lab-wide requirements and their descriptions and implementing procedures are shown in Attachment I. Implementation of the remaining 12 elements is the responsibility of the Responsible Line Manager, or as directed by PPPL senior management. These specific conduct of operations elements are implemented using a graded approach using procedures developed and approved in accordance with ENG-030.

Projects designated "high hazard", as defined by PPPL ES&HD 5008 section 11, are required to demonstrate implementation of the Conduct of Operations Program by developing an implementation procedure with a conduct of operations matrix consisting of the 18 requirements with either a citation of specific implementing documentation or a justification for each item that is not implemented. For D-Site and NSTX the applicable procedure is OP-AD-39, Conduct of Operations.

As an aid to implementing Integrated Safety Management, including conduct of operations, PPPL convenes two regularly scheduled operations meetings overseen by the Associate Director of Engineering and Infrastructure:

The 8:30 AM Operations Meeting is a daily (Monday through Friday) meeting to co-ordinate daily and near-term work activities and interrelated processes on site, including project, infrastructure and engineering work activities.



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The Engineering Rollover Meeting is a weekly meeting held to review and schedule longer term plans and work activities for co-ordination, authorization, impact assessment and resource allocation. This meeting utilizes department schedules and Gantt charts to plan work activities and identify any necessary changes or challenges in work scheduling.

#### Introduction

The DOE requires compliance to the matrix of requirements listed in DOE Order 422.1, Conduct of Operations. Most of these requirements are met at the Lab level via the Policies, Procedures and Manuals used to describe activities within the Lab. The rest of the requirements are met using Department or Project Procedures that address specific functions that are handled at the Department or Project level due to the variable situations and needs of each. The listing of DOE requirements and the corresponding Lab wide Policy, Procedure or Manual citation may be found at: (http://www-local.pppl.gov/eshis/O.422.1-ConOps-Lab-wide-Matrix.docx). Department or Project corresponding Procedures to meet additional DOE requirements may be found within individual Department or Project Web Pages. A form for addressing Department or Project level requirements may be found at: (http://www-local.pppl.gov/eshis/O.422.1-ConOps-Proj-Dept-Template.docx).

#### **References**

- 1. DOE Order 422.1, Conduct of Operations
- 2. PPPL ES&HD 5008, Safety Manual
- 3. ENG-030, PPPL Technical Procedures for Experimental Facilities
- 4. ENG-032, Work Planning Procedure
- 5. OP-AD-39, Conduct of Operations
- 6. P-083, Lessons Learned and Their Promulgation

### **Procedure**

#### Part A: Laboratory-wide Conduct of Operations Elements

<b>Responsibility</b>	Ac	tion
Associate Director Engineering & Infrastructure	1.	Directs line organizations to develop, deliver and maintain policies, procedures and/or manuals for Laboratory-wide conduct of operations elements (see Attachment I).
Responsible Line Manager (RLM)	2.	Defines policies, procedures and/or manuals that implement Laboratory- wide conduct of operations elements.
	3.	Coordinates with security, radiation safety and access security to allow full implementation of all operations procedures.
	4.	Ensures periodic tests and inspections are performed and that anomalies

found in tests and inspections are highlighted in the log and brought to the

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- attention of the RLM for corrective action.
- 5. Ensures that alarm and enunciator functions remain operational at all times unless a T-Mod or Administrative Procedure excepts them.
- 6. Ensure periodical reviews of exposure trends of all monitored personnel to detect and correct adverse factors that contribute to personnel exposures.

# Part B: High Hazard Projects

<b>Responsibility</b>	Ac	tion
Associate Director Engineering & Infrastructure	1.	Directs High Hazard Project Operations Manager to develop conduct of operations implementation procedure including matrix of DOE requirements.
High Hazard Project Operations Manager	2.	Prepares, approves and implements conduct of operations procedure in accordance with this procedure and ENG-030.

# **Training (Section Required For All Procedures)**

Head, Project	1.	Specifies the appropriate training methods and means (below).
Management		A. Target Audience: RLM's, COG's, ATI's, Project Managers Instructor: <u>Head, Project Management</u> Training Method: <u>X</u> Briefing for each revision
		Frequency: X Annual as part of annual training for COG's PM's and RLM's

2. Notifies the Human Resources Training Office of the training so that Head, Project they will be aware of the training requirements and be able to provide Management assistance and guidance in the course development, implementation, tracking, and maintenance.

### **Records Requirements Specific To This Procedure**

Records Custodians must assure records are maintained as follows:

<b>Record Title</b>	Record Custodian	Location	<b>Retention Time</b>
No Records listed			

### Attachments

Attachment 1 Conduct of Operations Elements



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# **Conduct of Operations Elements**

# **ELEMENTS IMPLEMENTED LABORATORY WIDE**

Requirement/Element	Implementing Organization	Notes/Citation
Organization and Administration	PPPL Directors Office, Deputy Director of Operations Associated Director of Engineering and Infrastructure (ADEI)	Directors Office is responsible for establishing and maintaining the overall Laboratory organization and it's departments. The ADEI is responsible for assigning Responsible Line Managers and approving their selection, See also ENG-057, COG, RLM, and Project Manager Selection and Training
Investigation of Abnormal Events, Conditions, and Trends	COG, RLM, Site Protection Division	Laboratory procedure GEN-006, Investigation and Follow-up of Adverse Events and Conditions including Occurrence Reporting and Price Anderson Amendment Act Reviews, Operating personnel periodically review alarms, trends, and Limiting Conditions for Operation and Action Statements in effect for proper implementation.
Notifications	Site Protection Division	Laboratory procedure GEN-006, Investigation and Follow-up of Adverse Events and Conditions including Occurrence Reporting and Price Anderson Amendment Act Reviews. See also Information Technology Division Policies and Procedures
Lockout and Tagouts	Engineering and Infrastructure	ESH-016, Control of Hazardous Energy (Lockout/Tagout)
Control of Interrelated Processes	Engineering and Infrastructure	Interrelated processes are authorized through the Engineering Rollover Meeting and 8:30AM meeting, discussed in ENG-055 (this procedure) as well as ENG- 032, <i>Work Planning Procedure</i> and ENG-049, <i>Project</i> <i>Status and Oversight</i> . Content of COG, RLM and PM training shall include interrelated processes, reading and interpreting instrument readings.
Technical Procedures	Engineering and Infrastructure	Laboratory procedure ENG-030, PPPL Technical Procedures for Experimental Facilities



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# **ELEMENTS IMPLEMENTED USING GRADED APPROACH**

Shift Routines and Operating	Ensuring shift operators are alert, informed and operate properly;
Practices	Prompt notification to operating personnel and supervisors of changes in facility status, abnormalities or difficulties;
	Adherence by operating personnel and other workers to establish safety requirements:
	Awareness by operating personnel of the status of equipment through inspection, conducting
	checks, and periodic supervisory reviews of round sheets or inspection logs;
	Procedures for protecting operators from personnel hazards, e.g. chemical, radiological, laser,
	noise, electromagnetic, toxic or nano-scale materials;
	Prompt response to instrument indications, including the use of multiple indications to obtain
	parameters;
	Procedures for resetting protective devices;
	Authorization to operate facility equipment;
	Designating shift operating bases and providing equipment for them;
	Professional and disciplined operator performance of duties;
	Management of shift and operator workload to keep administrative activities a minor part of shift
	responsibilities, and provision of a second operator when pressing administrative tasks compete for operator attention;
	Scheduled inspection rounds by a separate employee of equal or higher grade as the operator to
	verify all instrument readings and readouts critical to safety and operation as defined in
	Technical Procedures, Round Sheets, Checklists and logs; and
	Situations requiring caution tags are brought to the attention of responsible managers, who
	approve them if necessary.
Control Area Activities	Establishing and implementing operations practices that promote orderly, business-like control
	area operations and addressing:
	Control-area access;
	Formality and discipline in the control and at-the-controls areas;
	Surveillance of control panels and timely response to determine and correct the cause of
	abnormalities/out-of-specification conditions;
	Authorization to energies control area equipment
Communications	Autorization to operate control area equipment.
Communications	establishing and implementing operations practices that ensure accurate, unambiguous
	communications among operations personnel and addressing:



Provision of communications systems for emergency and normal operations;
Administrative control of communications equipment, including authorization to use the public
address system and allowable locations for purposes for radio use;
Methods for control areas to contact operators and supervisors;
Communication of changes of status to all appropriate personnel;
Use of abbreviations and acronyms;
Use of oral instructions and communications, including use of repeat-backs and sender/receiver identification;
All Facility Emergencies are communicated to all facility personnel with the public address system using special alarm tones to begin each such announcement. Emergency
communications have priority over other communications;
Communications systems, include facility-wide public address system, the Control Room and public address system, and the hand-held radios of C Site and D Site, shall be periodically tested as directed by the Facilities Manager and the ES&H Director;
Choice of channel shall be determined by need, availability, and the requirements of the communication message (timeliness, multiple recipients) in increasing order of precedence: 1. Voice.
2. Telephone.
3. Radio.
4. Facility-wide public address system (Emergency Voice and Evacuation System (EVES)).
Operators, COGs and RLMs shall use Voice, Telephone or Radio for routine communications;
Personnel may use any available means to communicate with the Control Room. The D Site
Address/Emergency Alert and Evacuation System is preferred for emergency alerts;
Access to emergency notification channels is posted in appropriate areas; and
Radio usage is controlled to prevent electronic interference with facility equipment. Radio
prohibited areas are defined and marked.

On-Shift Training	Establishing and implementing operations practices that control on-shift training of facility
	operators, prevent inadvertent or incorrect trainee manipulation of equipment and address:
	On-shift training program;
	Authorization and documentation of training activities;
	Supervision and control of personnel under instruction by qualified personnel;



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	Facility conditions and controls for conduction training during operational activities, including
	suspension of training during unanticipated or abnormal events; and
	Scope of training shall include Independent Verification, and the Operator Aids process and the
	proper use of operator aids.
Control of Equipment and System	Establishing and implementing operations practices for initial lineups and subsequent changes to
Status	ensure facilities operate with known, proper configuration as designed and addressing:
	Authorization for, and awareness of, equipment and system status changes;
	Initial system alignment, and maintaining control of equipment and system status through startup,
	operation, and shutdown, ad documentation of status;
	Use and approval of lockouts and tagouts for administrative control of equipment status (see
	lockout and tagouts);
	Operational limits compliance and documentation;
	Management of equipment deficiencies, maintenance activities, post-maintenance testing, and
	return to service;
	Awareness and documentation of control panel and local alarm issues;
	Control of temporary equipment modifications and temporary systems;
	Equipment or systems that are tripping alarms or otherwise having repetitive problems will
	require investigations to determine and correct the cause(s);
	Configuration control and distribution of engineering documents; and
	Awareness of equipment and system status and changes, and authorization to intervene were
	appropriate, including assuming control of automated systems.
Independent Verification	Establishing and implementing operations practices to verify that critical equipment configuration
	is in accordance with controlling documents and addressing:
	Structures, systems, components, operations, and programs requiring independent verification;
	Situations requiring independent verification;
	Methods for performing and documenting independent verification;
	Schedules routine inspections to routinely achieve independent verifications during normal
	testing and operation;
	Situations, if any, allowing concurrent dual verification;
	Methods for performing concurrent dual verification, if used;
	Reasonable exemptions from verification shall be allowed where unnecessary because
	mispositioning or variance in reading is immediately known to operators or, or safety
	considerations prevent verification;
	Ensure independence, including having each check include identification of the component



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and determining both its required and actual position, and minimizing interactions
between operators positioning components and those verifying position, except in special
situations for throttled valves or to reduce radiation or toxic exposure (concurrent dual
verification);
Check throttled valves using local mechanical position indicators, scribe marks, or other
authorized methods (preferred over shutting and then opening a prescribed number of
turns). If shutting/opening is necessary, use concurrent dual verification;
Use direct local position checks rather than surveillance testing to show component positions.
If surveillance tests are used, they must conclusively prove component position and must
be specifically approved by operations management;
In order to determine if Independent Verification is required, use of accepted safety analysis
methods such as fault tree, probability risk analysis, or with participation of expert opinion
(such as RLM), are used to develop the list of equipment/components that require
independent verification of specifications, configuration, settings, and/or operation;
Shift supervisor or other appropriate manager shall be notified of any observed misalignments,
and charges the manager with determination of the proper remedial or correction to take in
immediate operations and in operator training;
Verification readings include procedures ensure independence, including having each check
include identification of the component and determining both its required and actual position,
and minimizing interactions between operators positioning components and those verifying
position, except in special situations for throttled valves (using local mechanical indicators,
scribe marks, etc.), methods that conclusively prove component position, or to reduce
radiation or toxic exposure (concurrent dual verification);

Logkeeping	Establishing and implementing training and operations practices to ensure thorough, accurate, and
	timely recording of equipment information for performance analysis and trend detection, and
	addressing:
	Narrative logs at all key positions, as defined by management, for the recording of pertinent
	information;
	Prompt and accurate recording of information;
	Type, scope, and format for log entries;
	Method for recording late entries and correcting erroneous entries without obscuring the original
	entry;

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	Periodic supervisory reviews for accuracy, adequacy, and trends;		
	Document retention requirements; and		
	Scope of log entries includes, but is not limited to:		
	Compliance with operational limits, and		
	Corrective actions for out-of-limits readings, alarm conditions, and safety trips.		
Turnover and Assumption of	f Establishing and implementing operations practices for thorough, accurate transfer of informativ		
Responsibilities	and responsibilities at shift or operator relief to ensure continued safe operation and addressing:		
	Definitions for all key positions requiring a formal turnover process;		
	Turnover of equipment/facility status, duties, and responsibilities that results in the safe and		
	effective transfer of equipment status and in progress or planned activities from one shift or		
	workgroup to the next; and		
	Process for relief during a shift.		
Required Reading	Establishing and implementing operations practices for an effective required reading program to		
	keep operators updated on equipment or document changes, lessons learned, or other		
	important information, and addressing:		
	Identification of material to be distributed via required reading;		
	Periodic reviews shall be conducted to remove obsolete items from distribution;		
	Identification of which personnel are required to read specific required reading items; and		
	Distribution of required reading to appropriate personnel and documentation of their timely		
	completion.		

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Timely Instructions/Orders	Establishing and implementing operations practices for timely written direction and guidance from
	management to operators, addressing:
	Appropriate circumstances for the use of timely instructions/orders,
	Designated levels of review and approval prior to issuance,
	Configuration control of timely instructions/orders, and
	Distribution of timely instructions/orders to appropriate personnel and documentation of their
	receipt and understanding.
Operator Aids	Establishing and implementing operations practices to provide accurate, current, and approved operator aids, addressing:
	Technical evaluation and management approval of operator aids;
	Operator aids serve as conveniences, not operational requirements;
	Operator aids do not obscure equipment;
	Administrative control of installed operational aids;
	Operator Aids shall be sturdy, and securely mounted or stowed, and waterproof or appropriately resistant to their installed operating environment as appropriate;
	Periodic reviews ensuring conformance of Operator Aids with approved list, and updating of Operator Aids as needed to ensure continued conformance and accurate reflection of source material: and
	Operator Aids shall not alter procedures; procedure revisions shall be in accordance with ENG-030.
Component Labeling	Establishing and implementing operations practices for clear, accurate equipment labeling, addressing:
	Components that require a label;
	Label information that uniquely identifies components and is consistent with regulations, standards and facility documents;
	Durable and securely attached labels that do not interfere with controls or equipment:
	Administrative control of labels, including a process for promptly identifying and replacing lost or damaged labels, preventing unauthorized or incorrect labels, and control of temporary labels;
	All new piping (As of 9/1/2015) will be identified using the labeling requirements of ANSI A13.1 as the guidance standard; and
	Labels will have unique identification numbers.