

Electronic Radiation Safety Work Control Forms at SLAC

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2012 Workshop on Accelerator Operations



Radiation Safety Work Control Form (RSWCF) Purpose



Configuration Control of Credited Radiation Safety Systems is internally required by SLAC, in order to comply with DOE Order 420.2C

- SLAC Guidelines For Operations
- Radiation Safety Systems Technical Basis Document

Credited Radiation Safety Items:

- Personnel Protection System (PPS)
- Beam Containment System (BCS)
- Shielding
- Accelerator Housing Integrity

Radiation Safety Work Control Form Purpose

Radiation Safety Work Control Form (RSWCF) is an administrative tool used to document and guide a process:

- Define Scope of Work
- Determine appropriate controls
 - Requirements before starting work
(control radiological hazards during work)
 - Checkout requirements after work
- Execute work within controls
- Delineate end of work, bringing Radiation Safety Credited Controls back into active service after work and checkout/certification is complete



RSWCF Process Participants

Many people from multiple work groups participate in the planning, approval, and execution of work on credited radiological controls:

- Work Requestor
- Person Responsible (for executing work)
- Area Manager
- Radiation Physicist (representing Radiation Safety Officer)
- AD Safety Officer (ADSO)
- Engineering Operator in Charge (EOIC)
- Safety Systems Engineers & Technicians

RSWCF process must be understood and followed by all participants

- Ensure work is only performed under the correct controls
- Ensure Radiation Safety Credited Controls are returned to active service only when they are in a safe and certified configuration

RSWCFs: The Old Way



Paper forms were kept in a binder in the Main Control Room.

Advantages:

- Track record of use (20+ years, 3500+ RSWCFs)
- Robust against computer outages
- Flexible

Disadvantages:

- Only available for reference/editing in the control room
- No searchable record or history logging
- No enforcement of correct workflow
- Not linked to other work planning tools
- Readability
- Wastes paper

**Accelerator Department
Radiation Safety Work Control Form**

Area: LCLS LDU: Dump Form #: 3334 Date: 21-Sept 2009

Section 1: Description of Work to be Done (include item or CATER number, job title, etc.) Cater # 87934
 Repair or Replace Install Remove Reinstall Bypass Unbypass
Re-charge BTM's 13, 15, QUE 16; 9.
(BTM 13 (Main Dump); BTM 15 (Safety Dump); BTMQUE 16
(Queue Hall); BTM 9 (BTH))
 Person Responsible signature/date: [Signature] 9-23-09 Area Manager signature/date: Kathleen K. Burgess 21-Sept.

Section 2a: Requirements Before Starting Work (ADSO completes this section)
Disable BTH stoppers (DZ, ST64, ST61)

Section 2b: Requirements After Completing Work (ADSO checks required boxes)
 BAS change PPS checkout Radiation Physics inspection BCS checkout
 OHP checkout Operations Other (describe) 1) charge BTM's
2) Close air supply valves
 ADSO signature/date: [Signature] 9/24/09 Radiation Physics signature/date: [Signature] 9/22/09

Section 3: Signoffs Indicating Requirements are Complete (ADSO checks required boxes) signature/date
 Requirements Before Starting Work Completed (See Section 2a): [Signature] 9/23/09
 Removed or Bypassed (PPS, BCS, Operations, or Person Responsible): _____
 Reinstalled or Unbypassed (PPS, BCS, Operations, or Person Responsible): _____
 Work complete (Person Responsible or Area Manager): _____
 PPS: [Signature] 9-23-09
 Radiation Physics: _____
 BCS: _____
 OHP: _____
 Operations: _____
 Other: Close valves: [Signature] 9-23-09

Section 4: Signoff Indicating Readiness for Beam to: _____
 ADSO signature/date: [Signature] 9/23/09 EOIC signature/date: [Signature] 9/23/09

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RSWCFs: The New Way

Electronic forms are managed within a web browser.

Advantages:

- Available from any web browser
 - remote viewing
 - electronic signature
- Searchable record of all forms
- History logging of each form
- Enforces correct workflow
- Linked to existing electronic trouble reporting and tracking system
- Linked to electronic log
- Readable
- Flexible

Disadvantages:

- New system: learning curve for users
- Vulnerable to computer outages

Electronic Radiation Safety Work Control Forms at SLAC

Feedback Logout

Search Form Advanced Search Dashboard

Radiation Safety Work Control Form Close This Window Refresh Form Help

Cancel History

RSWCF Number: 5413
CATER Id: 100530 Division: TEC
Logged in Name: Van Hoover, Zoe Role: ADSO

Section 1: Description of Work Section 1 Help

Work to be Done
 Repair or Replace Install Remove Reinstall Bypass Unbypass Trouble-Shoot

Description of work to be done
LCLS-I EBD: Leak check and re-charge PCP/MO/QUE BTM 16 losing pressure @ 10.342 PSI.

Person Responsible: Keenan, Marcus E.
Area: DMP (EBD)
PPS Zone: BTH
Job: 1 LCLS-I PAMM of 27-June: Leak check and recharge EBD BTM 16.
Area Manager Released: Burrows, Kathleen K 06/25/2012 11:57 kaublani
Group:

RSWCF Status Closed

Section 2: Requirements before work starts (ADSO, RP, and EOIC completes this section) Section 2 Help

BAS • LCLS Undulator Complex BAS (Active) 06/27/2012 11:29 devon

Check here if ADSO requirements are needed before work starts 06/26/2012 08:47 zoevh

ADSO Requirements Before Starting Work (Check all required boxes)
 BAS change PPS RPFQ Operations Other ADSO

Description of requirements before starting work
Disable BTH stoppers: D2, ST60, ST61

ADSO Approval: Van Hoover, Zoe 06/28/2012 08:50 zoevh
Radiation Physics Approval: Santana, Mario 06/28/2012 12:46 msantana
Requirements before work, completed (section 2) EOIC: Alverson, Shawn Christopher 06/27/2012 06:28 alverson

RSWCF Status Closed

Section 3: ADSO work requirements and worker completion signoff section. Section 3 Help

ADSO Work Reqmts
 ADSO Work Requirements Removed or Bypassed Reinstalled or Unbypassed Work Complete PPS
 Radiation Physics BCS RPFQ Operations BAS Change
 Other

Work Complete (Person Responsible or Area Manager)	Worker Completion Signoff	ADSO Review
Please indicate work complete: BTM leak check (describe any leaks found and repairs made). Lock BTM cabinet at conclusion of work. 06/26/2012 08:50 zoevh	Instrument Tech, Daniel made slight adjustment to the 1/8" cooled stainless steel fitting that goes from the BTM control box to QUE BTM. 06/27/2012 12:45 kaublani	Miller, Paul 06/27/2012 13:41 moibbs
PPS Recharge BTM/CPM/MO/QUE BTM 16 following completion of leak-check/repair 06/26/2012 08:50 zoevh	Worker Completion Signoff The box is locked and the BTM is recharged. 06/27/2012 11:29 devon	ADSO Review Miller, Paul 06/27/2012 13:41 moibbs
Operations Complete safety inspection item for BTM16 06/26/2012 08:50 zoevh	Worker Completion Signoff Ops completed safety inspection for this item, found no problems. 06/27/2012 20:43 moibbs	ADSO Review Miller, Paul 06/27/2012 20:45 moibbs

Section 4: Signoff Indicating Readiness for Beam Section 4 Help

ADSO Work Completion Review: Miller, Paul 06/27/2012 20:46 moibbs

Beam Requirements
Beam requirements in section 4 are complete or are not required, ADSO review to close

EOIC Closure Approval: Gibbs, Matt 06/27/2012 20:46 moibbs

Section 5: Attachments
no attachments found

Cancel

Document Number: SLAC-I-020-301-001-00-R000

RSWCF Status Closed

RSWCF Status Closed

RSWCF Workflow: New Form

Feedback Logout

Search Form Dashboard

Radiation Safety Work Control Form Close This Window Refresh Form Help

Cancel Save

CATER Problem Id: 93288
Logged in Name: Warren, Jonathan
Logged in Role: EOIC

Section 1: Description of Work Section 1 Help

Work to be Done
 Repair or Replace Install Remove Reinstall Bypass Unbypass Trouble-Shoot

Description of work to be done

Person Responsible

Area (Select)

PPS Zone (Select)

Job (select)

Area Manager Released (Select) All review is required

Group (Select)

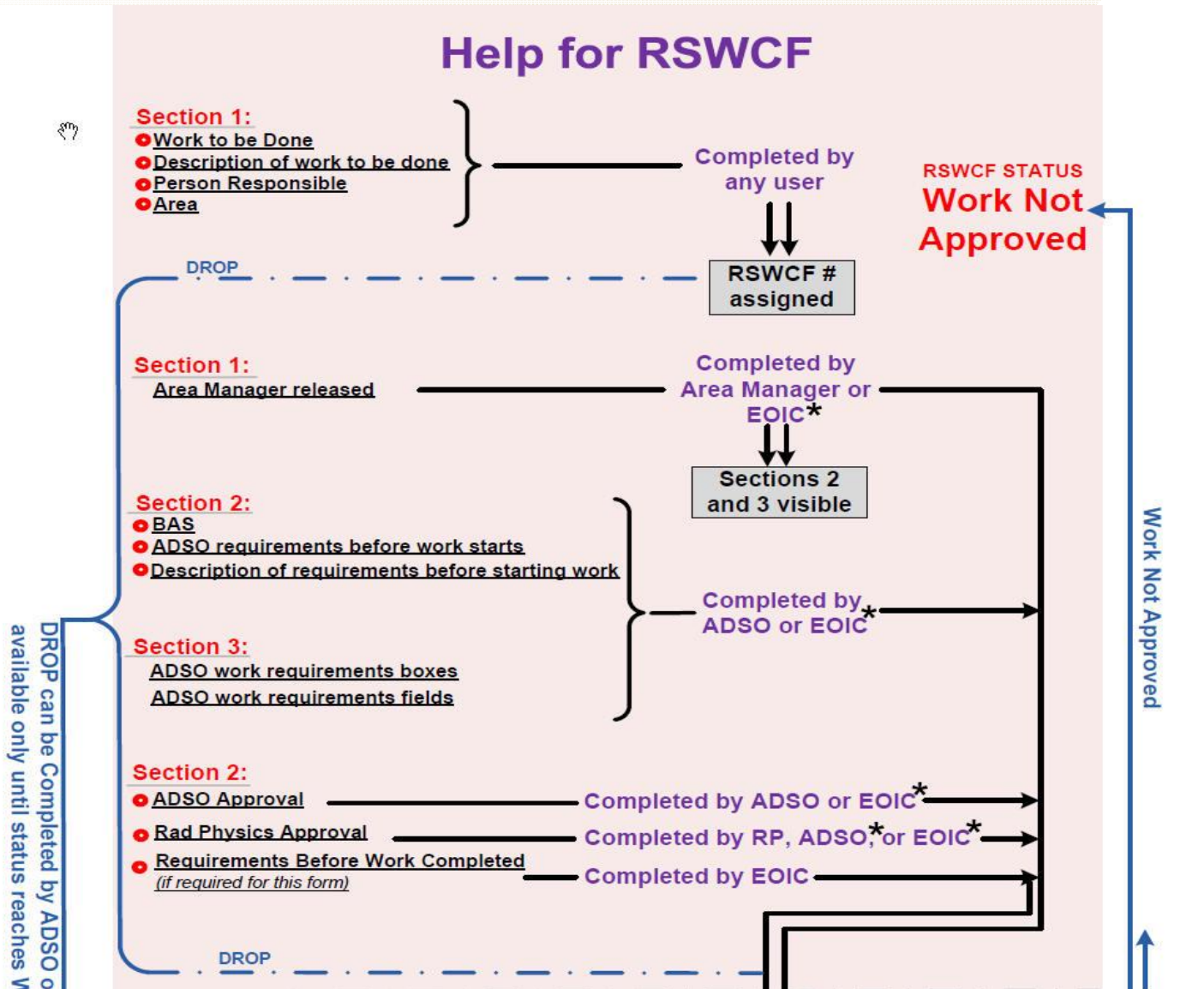
Cancel Save

Document Number: SLAC-I-020-301-001-00-R000

**RSWCF Status
Work Not
Approved**

JWARREN

RSWCF Workflow: Work Not Approved



RSWCF Workflow: Sections 1 and 2

Section 1: Description of Work

Section 1 Help

Work to be Done

Repair or Replace Install Remove Reinstall Bypass Unbypass Trouble-Shoot

Description of work to be done

Install Bugger Plugs to ST1 and ST2 cables to make up in Status during downtime work.
New action: pull wires to turnoff Y/M signs in BTH, Dump, FEE. (see attachment)

168 of 4000

Person Responsible

Area

PPS Zone

Job

Area Manager Released 03/10/2011 14:46 kaibulan

Group

RSWCF Status
Work Approved

Section 2: Requirements before work starts (ADSO, RP, and EOIC completes this section)

Section 2 Help

BAS

BSY BAS		
CID BAS		
Damping Rings BAS		
ESA BAS		
GTL BAS		
General BAS		
LCLS FEE BAS		
LINAC East		
LINAC West BAS		
Positron Vault BAS		

LCLS Undulator Complex

03/10/2011 16:37 pmiller

Check here if ADSO requirements are needed before work starts 03/10/2011 16:39 pmiller

ADSO Requirements Before Starting Work (Check all required boxes)

BAS change PPS RPFO Operations Other ADSO

Description of requirements before starting work

disable BTH stoppers; D2, ST60, ST61.

37 of 4000

ADSO Approval 03/10/2011 16:39 pmiller

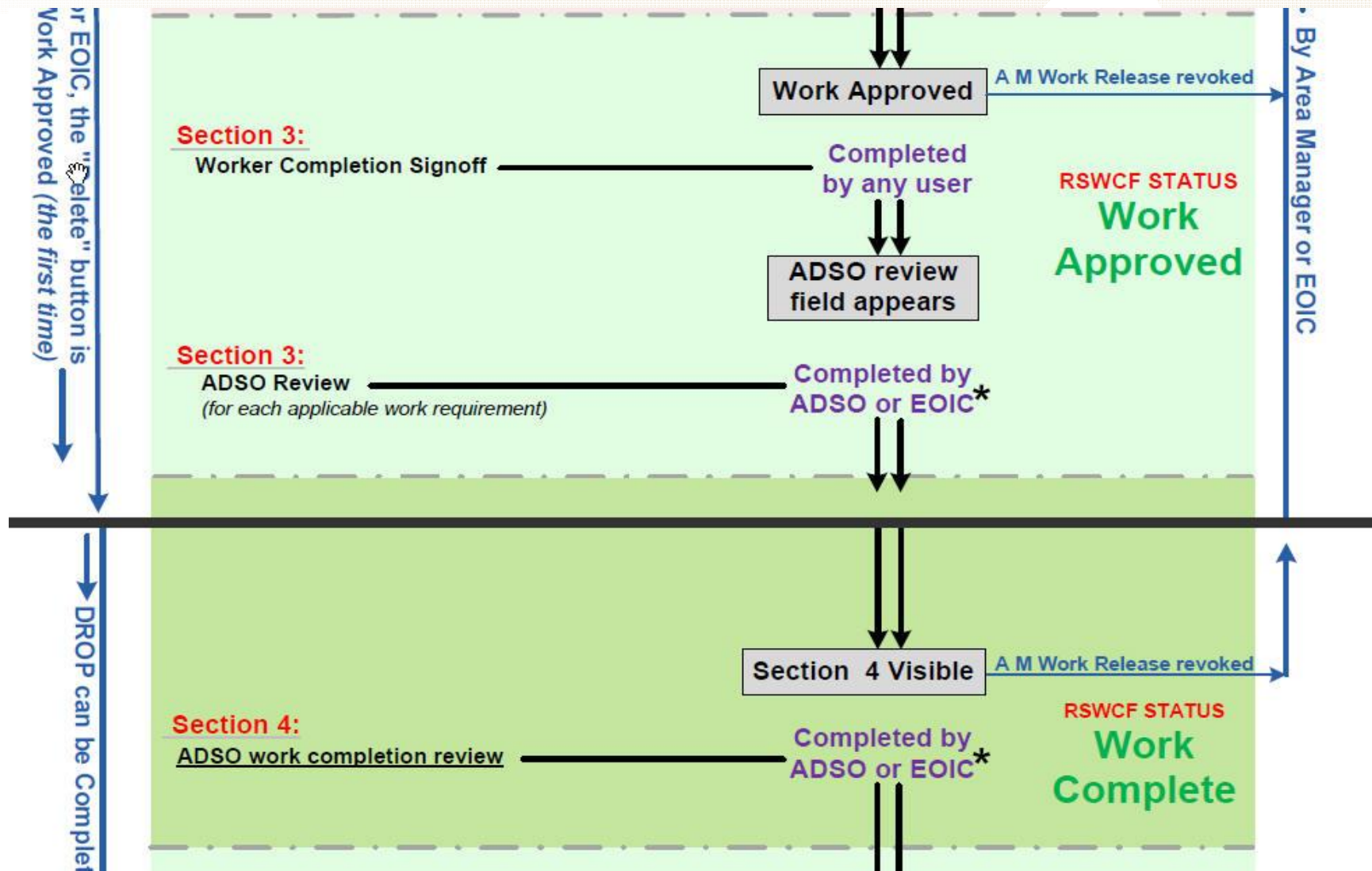
Radiation Physics Approval 03/10/2011 16:05 mao

Requirements before work, completed (section 2) EOIC 03/10/2011 17:20 mgibbs

RSWCF Status
Work Approved

RSWCF: Work Approved & Work Complete

SLAC



RSWCF Workflow: Sections 3 and 4

Work Complete (Person Responsible or Area Manager)

Stopper work complete and PPS wire connections restored. (see attached memo)

76 of 2000

04/04/2011 13:24 jwarren

Worker Completion Signoff

ST61 work complete and PPS wiring re-connected. Tested out as expected.

72 of 2000

04/04/2011 13:27 jwarren

ADSO Review

Miller, Paul

04/04/2011 13:59 jwarren

RSWCF Status
Work Complete

PPS

BTH, Dump and FEE PPS IAT testing completed.

44 of 2000

04/04/2011 13:24 jwarren

Worker Completion Signoff

PPS IAT testing has been completed.

35 of 2000

04/04/2011 13:58 jwarren

ADSO Review

Van Hoover, Zoe

04/04/2011 13:59 jwarren

Section 4: Signoff Indicating Readiness for Beam

Section 4 Help

ADSO Work Completion Review (Select)

Beam Requirements

[Empty text area for beam requirements]

RSWCF Status
Work Complete

Beam requirements in section 4 are complete or are not required, ADSO review to close

EOIC Closure Approval

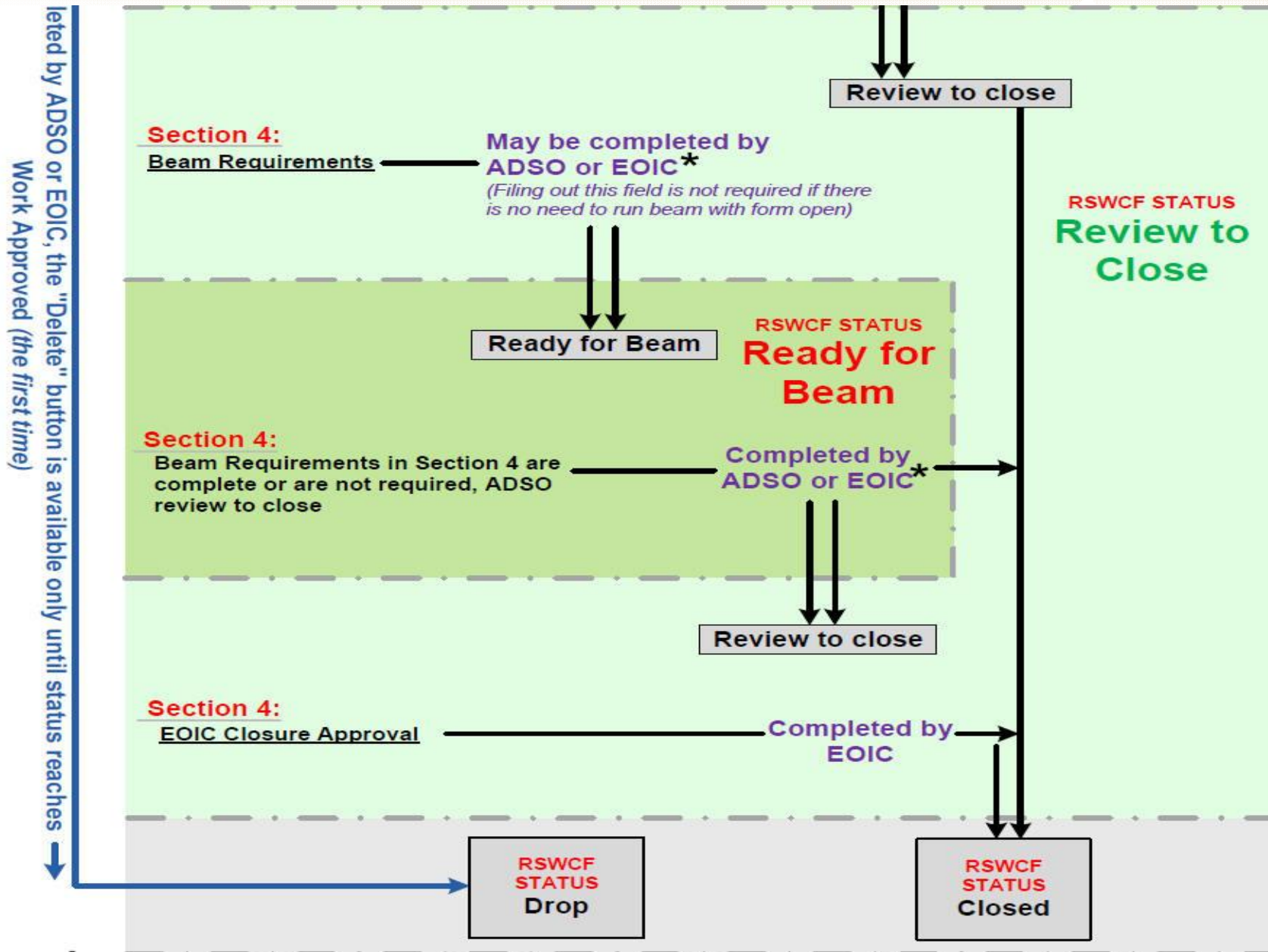
Section 5: Attachments

Upload A New File

Edit	Name	Comments
	RSWCF_505311.pdf	-

RSWCF Status
Work Complete

RSWCF: Review to Close & Closed



Electronic RSWCF Requirements

- Accessible yet secure
- History – Audit trail
- Documentation Configuration Control
- Work Flow
- Electronic Signature
- Error Handling
- Read-Only Version
- Timeout
- Integration with CATER (Comprehensive Accelerator Tool for Enhancing Reliability)
- Extensive checkout before releasing into production

CATER



SLAC

- Web-based tool for reporting and tracking problems and scheduling maintenance
- Oracle database
- Developed using Oracle Application Express (APEX)

New CATERs

HARDWARE									
CATER	Status	Subsystem	Area	Description	Soln	Jobs	Shop	Urgency	
93436	In Progress	Klystron Modulator	LINAC WEST	KLYS LI10 61 --- 10-6: J7 cable connector that connects from SLED to MKSU was broken at MKSU.			AMRF	Sc	
93435	In Progress	Camac	LINAC WEST	--- LI02 YCOR 900: Channel drifting out of tols even after multiple MCOR module swaps. Request DAC module replacement at LI02 crate 5 module 18.			HDWR	Sc	
93434	Scheduled Jobs	Electricity	LINAC EAST	--- Install circuit breaker in Linac Large Pumping system.		1	CEFE	Sc	
93433	Review to close	Camac	LINAC WEST	LI13 --- LI13 LINAC Magnets: All magnets associated with SAM crate 1, module 2 show "ADC ERROR". "OK" LED not flashing. Please replace the module.			HDWR	Sc	
93432	Scheduled Jobs	Other	HER	--- PEP II Tunnel 2A: Cut 2 1/2" hole in the expanded metal PPS gate transom for the installation of a 2" compressed airline Region 2A.		1	Other	Sc	
93431	In Progress	Dc Magnets	LINAC WEST	YCOR LI02 900 --- LI02 YCOR 900 is drifting out of tolerance.	1		PEM	Sc	
93430	Closed	Water	LINAC EAST	ACCC LI29 --- LI29 Collimator in housing, Leak at ACS return. Needs to be replaced.			CEFOP	Sc	
93429	In Progress	Pps	FEE	--- Need to change S0 ST1, ST2 stopper enable-disable key switch.			CTL	Sc	
93428	Review to close	Dc Magnets	LINAC WEST	LI13 --- LI13 Correctors: LI13 was offline fixed by CTL, then ADC errors. Did a SAM reset. Still most fail to trim.			PEM	Sc	

Problem Description

*
DVR in MCC is making a clicking noise like a relay flipping on and off repeatedly. This seems to correspond with the top left quadrant video picture on the monitor next to the DVR losing and regaining its signal. The other signals from the DVR to that monitor seem fine.

Jobs [Add Job](#)
no data found

Radiation Safety Work Control Forms [Add Radiation Safety Work Control Form](#)
no data found

Solutions [Add Solution](#)
no data found

Attachments and Files [Upload New File](#)
no data found

Beamlost Time [Add Beam Lost Time](#)
no data found

Facilities FAMIS Information
no data found

Electronic RSWCF Introduction Timeline

- 2010: In-house development and testing
 - First round of development
 - Preliminary testing and feedback from operations group
 - Second round of development
 - Sept-Oct: ADSO and Maintenance Office testing
 - Nov: Created formal checkout procedure
 - Dec: Executed final checkout
- January 2011: Released for 2-Mile LINAC Facility
- May 2012: Released for SPEAR Facility

- Over 450 Electronic RSWCFs processed since introduction

Future Projects

- Expand for use in additional Facilities:
 - NLCTA (Next Linear Collider Test Accelerator)
 - SSRL and LCLS Experimental Facilities
- E-mail integration
- Additional CATER integration with electronic logbook