

<b>Brookhaven National Laboratory/ National Synchrotron Light Source II</b>			
<b>Subject:</b>	<b>Insertion Device Controls System Test Report</b>		
<b>Number:</b>	<b>PS-R-ASD-ID-CO-RPT-001</b>	<b>Revision: 1</b>	<b>Effective: 5/16/2017</b>
			<b>Page: 1 of 8</b>

**Insertion Device:** Cell 07 U42

**Test Date:** 5/16/2017

**ID Representative:** Dean Hidas

**Controls Engineer:** Qingfu Tang/25463

**Overview**

This test checklist covers the testing required for the control system of an NSLS-II insertion device. The checklist may be used for site acceptance in the lab and also for post-installation acceptance.

**Pre-test setup for site acceptance test in the lab**

Confirm with ID group that the following activities have been completed:

- ID is in the lab
- cabling termination, continuity checks and connection
- controls hardware installation into the lab rack racks
- main power and other utility connections

**Pre-test setup for post-installation test**

Confirm with ID group that the following activities have been completed:

- ID installation in storage ring tunnel
- cabling termination, continuity checks and connection
- controls hardware installation into mezzanine racks
- main power and other utility connections
- machine EPS connections

<b>Brookhaven National Laboratory/ National Synchrotron Light Source II</b>			
Subject:	<b>Insertion Device Controls System Test Report</b>		
Number:	<b>PS-R-ASD-ID-CO-RPT-001</b>	Revision: <b>1</b>	Effective: <b>5/16/2017</b> <span style="float: right;">Page: <b>2 of 8</b></span>

**Test execution**

Execute the test checklist below. Initial and date each step upon completion of the step. Note any and all issues.

Acceptable entries for Result column:

- Enter: OK for tests passed
- Enter: NOT OK for tests that fail and record a DR number in the Task Data/Issues column
- Enter: DONE for tasks completed
- Enter: N/A for steps that are non-applicable. Enter a reason in the Task Data/Issues column

Document any discrepancies in a DR in accordance with PS-QAP-0002, *Discrepancy Reporting*. Record the DR number in the appropriate step on the checklist and the appropriate operation on the ID traveler.

<b>Brookhaven National Laboratory/ National Synchrotron Light Source II</b>			
Subject:	<b>Insertion Device Controls System Test Report</b>		
Number:	<b>PS-R-ASD-ID-CO-RPT-001</b>	Revision: 1	Effective: 5/16/2017
			Page: 3 of 8

### Insertion Device Control System Installation Test Checklist

Insertion Device Part No:	Serial No:	Cell No:	Beamline:
<b>Check one:</b>	<b>Pre-Installation Test</b>	<b>Post-Installation Test</b>	
Test Item	Result	Initial/ Life no	Date
<b>Before power on, check following cable connections</b>			
Motor power cable	OK	RL/25595	5/11/2017
Motor encoder cable (rotary encoder)	OK	RL/25595	5/11/2017
Linear encoder cable	OK	RL/25595	5/11/2017
PMAC power and network cable	OK	RL/SS	5/11/2017
PLC power and network cable	OK	RL/25595	5/11/2017
Moxa power, network and serial communication cable	N/A		
<b>Turn on rack power and controller power</b>			
PMAC power up	OK	QT/25463	5/12/2017
PLCs power up	OK	QT/25463	5/12/2017
Moxa power up	N/A		
<b>Pre-motion check</b>			
Upper beam open gap limit pressed and indicates on display	OK	QT/25463	5/16/2017
Upper beam close gap limit pressed and indicates on display	OK	QT/25463	5/16/2017
Lower beam open gap limit pressed and indicates on display	N/A		Axis does not exist on device
Lower beam close gap limit pressed and indicates on display	N/A		Axis does not exist on device
Upper beam open gap kill pressed and indicates on display	OK	QT/25463	5/16/2017

Brookhaven National Laboratory/ National Synchrotron Light Source II			
Subject:	<b>Insertion Device Controls System Test Report</b>		
Number:	PS-R-ASD-ID-CO-RPT-001	Revision: 1	Effective: 5/16/2017 Page: 4 of 8

Insertion Device Part No:	Serial No:	Cell No:	Beamline:	
Check one:	Pre-Installation Test	Post-Installation Test		
Test Item	Result	Initial/ Life no	Date	Task Data/Issues
Upper beam close gap kill pressed and indicates on display	OK	QT/25463	5/16/2017	
Lower beam open gap kill pressed and indicates on display	N/A			Axis does not exist on device
Lower beam close gap kill pressed and indicates on display	N/A			Axis does not exist on device
Elevation (upstream and downstream or common) upper and lower limits pressed and indicate on display	N/A			Axis does not exist on device
Elevation (upstream and downstream or common) upper and lower kills pressed and indicate on display	N/A			Axis does not exist on device
Top inboard phase limits pressed and indicate on display	N/A			Axis does not exist on device
Top outboard phase limits pressed and indicate on display	N/A			Axis does not exist on device
Bottom inboard phase limits pressed and indicate on display	N/A			Axis does not exist on device
Bottom outboard phase limits pressed and indicate on display	N/A			Axis does not exist on device
Top inboard phase kills pressed and indicate on display	N/A			Axis does not exist on device
Top outboard phase kills pressed and indicate on display	N/A			Axis does not exist on device
Bottom inboard phase kills pressed and indicate on display	N/A			Axis does not exist on device
Bottom outboard phase kills pressed and indicate on display	N/A			Axis does not exist on device

<b>Brookhaven National Laboratory/ National Synchrotron Light Source II</b>			
Subject:	<b>Insertion Device Controls System Test Report</b>		
Number:	<b>PS-R-ASD-ID-CO-RPT-001</b>	Revision: 1	Effective: 5/16/2017
			Page: 5 of 8

Insertion Device Part No:	Serial No:	Cell No:	Beamline:	
Check one:	Pre-Installation Test	Post-Installation Test		
Test Item	Result	Initial/ Life no	Date	Task Data/Issues
Gap close limit pressed and indicates on display	OK	QT/25463	5/16/2017	
Gap close kill pressed and indicates on display	OK	QT/25463	5/16/2017	
Gap closed EPS switch pressed and indicates on display	N/A			
Gap open EPS switch pressed and indicates on display	N/A			
Bottom upstream home switch pressed and indicates on display	N/A			No display on the CSS GUI
Top upstream home switch pressed and indicates on display	N/A			No display on the CSS GUI
Bottom downstream home switch pressed and indicates on display	N/A			No display on the CSS GUI
Top downstream home switch pressed and indicates on display	N/A			No display on the CSS GUI
Elevation (upstream and downstream or common) home switch(es) pressed and indicate on display	N/A			Axis does not exist on device
Top inboard phase home pressed and indicate on display	N/A			Axis does not exist on device
Top outboard phase home pressed and indicate on display	N/A			Axis does not exist on device
Bottom inboard phase home pressed and indicate on display	N/A			Axis does not exist on device
Bottom outboard phase home pressed and indicate on display	N/A			Axis does not exist on device
Emergency stop pressed and indicates on display	OK	QT/25463	5/16/2017	
Emergency stop pressed and indicates on amplifiers	OK	QT/25463	5/16/2017	
Check all linear and rotary encoders reading out	OK	QT/25463	5/15/2017	
Check (set) linear encoder offset	OK	QT/25463	5/16/2017	

<b>Brookhaven National Laboratory/ National Synchrotron Light Source II</b>			
Subject:	<b>Insertion Device Controls System Test Report</b>		
Number:	<b>PS-R-ASD-ID-CO-RPT-001</b>	Revision: 1	Effective: 5/16/2017
			Page: 6 of 8

<b>Insertion Device Part No:</b>	<b>Serial No:</b>	<b>Cell No:</b>	<b>Beamline:</b>
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<b>Check one:</b>	<b>Pre-Installation Test</b>	<b>Post-Installation Test</b>
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Test Item	Result	Initial/ Life no	Date	Task Data/Issues
Record encoder offset of upstream bottom girder encoder	N/A	QT/25463		
Record encoder offset of upstream top girder encoder	Done	QT/25463	5/16/2017	-1060.00 µm
Record encoder offset of downstream bottom girder encoder	N/A	QT/25463		
Record encoder offset of downstream top girder encoder	Done	QT/25463	5/16/2017	-1730.00 µm
Record encoder offset of upstream elevation encoder	N/A			Axis does not exist on device
Record encoder offset of downstream elevation encoder	N/A			Axis does not exist on device
Record encoder offset of elevation encoder	N/A			Axis does not exist on device
Record encoder offset of top inboard phase encoder	N/A			Axis does not exist on device
Record encoder offset of top outboard phase encoder	N/A			Axis does not exist on device
Record encoder offset of bottom inboard phase encoder	N/A			Axis does not exist on device
Record encoder offset of bottom outboard phase encoder	N/A			Axis does not exist on device

**Motion test (from existing IOC or Delta Tau software)**

Enable amplifiers	OK	QT/25463	5/16/2017	
Gap open/close by Synchronous mode	OK	QT/25463	5/16/2017	
Elevation axis control functions	N/A			Axis does not exist on device
Motions stop correctly when emergency stop pressed	OK	QT/25463	5/16/2017	
Motions cannot start when emergency stop pressed	OK	QT/25463	5/16/2017	
Phase motion by Synchronous mode	N/A			Axis does not exist on device

**IOC migration and full motion range test**

Assign PMAC IP address	OK	QT/25463	5/16/2017	10.0.161.23
Assign PLC IP address	N/A			
Assign Moxa IP address	N/A			
Displays installed for control room use	Done	QT/25463	5/12/2017	
IOCs ported to central IOC servers	Done	QT/25463	5/12/2017	

Brookhaven National Laboratory/ National Synchrotron Light Source II				
Subject:	<b>Insertion Device Controls System Test Report</b>			
Number:	PS-R-ASD-ID-CO-RPT-001	Revision: 1	Effective: 5/16/2017	Page: 7 of 8

Insertion Device Part No:	Serial No:	Cell No:	Beamline:	
Check one:	Pre-Installation Test	<b>Post-Installation Test</b>		
Test Item	Result	Initial/ Life no	Date	Task Data/Issues
IOC connects and all motion-related PVs readout	OK	QT/25463	5/16/2017	
Upper and Lower Limit and Kill switches all read correctly on control room displays	OK	QT/25463	5/31/2017	-Lim: 11433.21    -Kill: 11267.18 +Lim: 150249.38    +kill: 150374.06
Elevation limit and kill switches read correctly on control room displays	N/A			
Phase limit and kill switches read correctly on control room displays	N/A			
Gap control functions tested from control room	OK	QT/25463	5/16/2017	
Gap control functions in the full range from Lower limit switch all the way to upper limit switch	OK	QT/25463	5/31/2017	
Elevation control functions tested from control room	N/A			
Phase control functions tested from control room	N/A			
External EPS switches read correctly open and closed gap in the control room	N/A			In separated test report
<b>MPS functional test</b>				
MPS power up and ready	OK	YT/22416	5/31/2017	
MPS IOC configured on central server	OK	YT/22416	5/31/2017	
MPS controls operational from control room	OK	QT/25463	9/27/2017	
<b>PLC functional test</b>				
PLC IOC configured on central server	N/A			
Temperature sensors reading correctly on control room displays	N/A			

<b>Brookhaven National Laboratory/ National Synchrotron Light Source II</b>				
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<b>Number:</b>	<b>PS-R-ASD-ID-CO-RPT-001</b>	<b>Revision: 1</b>	<b>Effective: 5/16/2017</b>	<b>Page: 8 of 8</b>

**Prepared by:**

X *Qingfu Tang*

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Signed by: Tang, Qingfu

**Concurred by:**

X *[Signature]*

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Cognizant Scientist *Dean Hidas*