

T1 & T2 Control System Upgrade Commissioning Plan		
Document-118467	Release No. 2	Release Date: 2016-04-14

<b>Test #10 – RS 54:</b> Check that duplicate signals removed from XTPAGEs (see Table 3 in Document-65170 Rev 4). If duplicate signals remain, check if acceptable by Controls group leader, Operations group leader, and T1 & T2 facility coordinator.	Duplicate signals removed, or approval given by individuals mentioned.		
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Tony  
6519

*This section has been tested and verified by the following people:*

	Name (print)	Role	Signature	Date
Tested by:				
Verified by:				

## 7 Final Safety Test with Beam

The purpose of the following tests is to confirm that signals going to the Central Safety System (CSS) from the T1 & T2 PLC to allow/disallow beam in BL1A as well as the beam overcurrent protection system are behaving as expected. These tests require beam to be run in BL1A.

Perform these tests after all other commissioning tests have been completed, the shielding has been restored over BL1A, and the cyclotron and BL1A are ready for operation.

These tests are not part of the official commissioning requirements and will not be included in the commissioning report, but are included as an additional safety check and should be documented for future reference.

TESTING STARTED  
JUNE 21, 2016  
@ 8:30AM

Action	✓	Result	✓	Comment
<b>Test #1 – "B1A:T1:TGTRDY":</b> i) Begin with all systems configured normally and the <i>B1A:T1:TGTRDY</i> , <i>B1A:T2:TGTRDY</i> , and <i>B1A:COL:STATOK</i> signals present	✓	i) <i>B1A:T1:TGTRDY</i> , <i>B1A:T2:TGTRDY</i> , and <i>B1A:COL:STATOK</i> signals display OK in EPICS and on XTPAGE	✓	
ii) Extract beam down BL1A	✓	ii) Beam is successfully extracted down BL1A	✓	
iii) In the PLC code force <i>B1A:CG2:STATOK</i> to be NOT OK or disconnect the appropriate wire in the PLC BOP	✓	iii) The T1 cooling system trips OFF, Beam trips OFF, <i>B1A:T1:TGTRDY</i> displays NOT OK	✓	



vi) Extract beam down BL1A	✓ vi) Beam is successfully extracted down BL1A	✓
<b>Test #4 – T1 Current Protection System:</b> i) Begin with all systems configured normally, the <i>B1A:T1:TGTRDY</i> , <i>B1A:T2:TGTRDY</i> , and <i>B1A:COL:STATOK</i> signals present, and the T1 target in Position 0  ii) Set the T1 Position 0 current limit to a value that can be safely exceeded  iii) Run beam down BL1A at a current below the limit  iv) Increase the current until it reaches the limit  v) Repeat the test with the T1 target at a ladder position with a target installed	✓ i) <i>B1A:T1:TGTRDY</i> , <i>B1A:T2:TGTRDY</i> , and <i>B1A:COL:STATOK</i> signals display OK in EPICS and on XTPAGE. The current protection page on XTPAGE indicates that the T1 target is in Position 0  ✓ ii) The current limit is changed successfully  ✓ iii) Beam is successfully extracted down BL1A  ✓ iv) When the current reaches the limit the cyclotron current is automatically reduced so that it is no longer at the limit or the beam trips off completely  ✓ v) The same results are observed as with the test at Position 0	✓  ✓ <i>Left at 10µA limit</i>  ✓  <i>Soft trip at ~12µA. Pulses reduced</i>  <i>Pos'n 4 limit set to 15µA</i> <i>Soft trip at ~17µA</i>
<b>Test #5 – T2 Current Protection System:</b> i) Begin with all systems configured normally, the <i>B1A:T1:TGTRDY</i> , <i>B1A:T2:TGTRDY</i> , and <i>B1A:COL:STATOK</i> signals present, and the T1 target in Position 0  ii) Set the T2 Position 0 current limit to a value that can be safely exceeded  iii) Run beam down BL1A at a current below the limit  iv) Increase the current until it reaches the limit  v) Repeat the test with the T2 target at a ladder position with a target installed	✓ i) <i>B1A:T1:TGTRDY</i> , <i>B1A:T2:TGTRDY</i> , and <i>B1A:COL:STATOK</i> signals display OK in EPICS and on XTPAGE. The current protection page on XTPAGE indicates that the T2 target is in Position 0  ✓ ii) The current limit is changed successfully  ✓ iii) Beam is successfully extracted down BL1A  ✓ iv) When the current reaches the limit the cyclotron current is automatically reduced so that it is no longer at the limit or the beam trips off completely  ✓ v) The same results are observed as with the test at Position 0	✓  ✓ <i>Left at 10µA limit</i>  ✓  <i>Soft trip at ~12µA</i>  <i>Pos'n I limit set at 20µA</i> <i>Soft trip at ~22µA</i>

*TESTING COMPLETED*

*END*

*JUNE 21, 2016*

*@ 9:10am By Tony TATEYAMA + Jesse KORMA*