

How to relocate a Neutron Beam Instrument to the Other Side of the Globe

Part 2, Installation and Commissioning

Stewart Pullen, Dr. Anton Le Brun (ACNS)

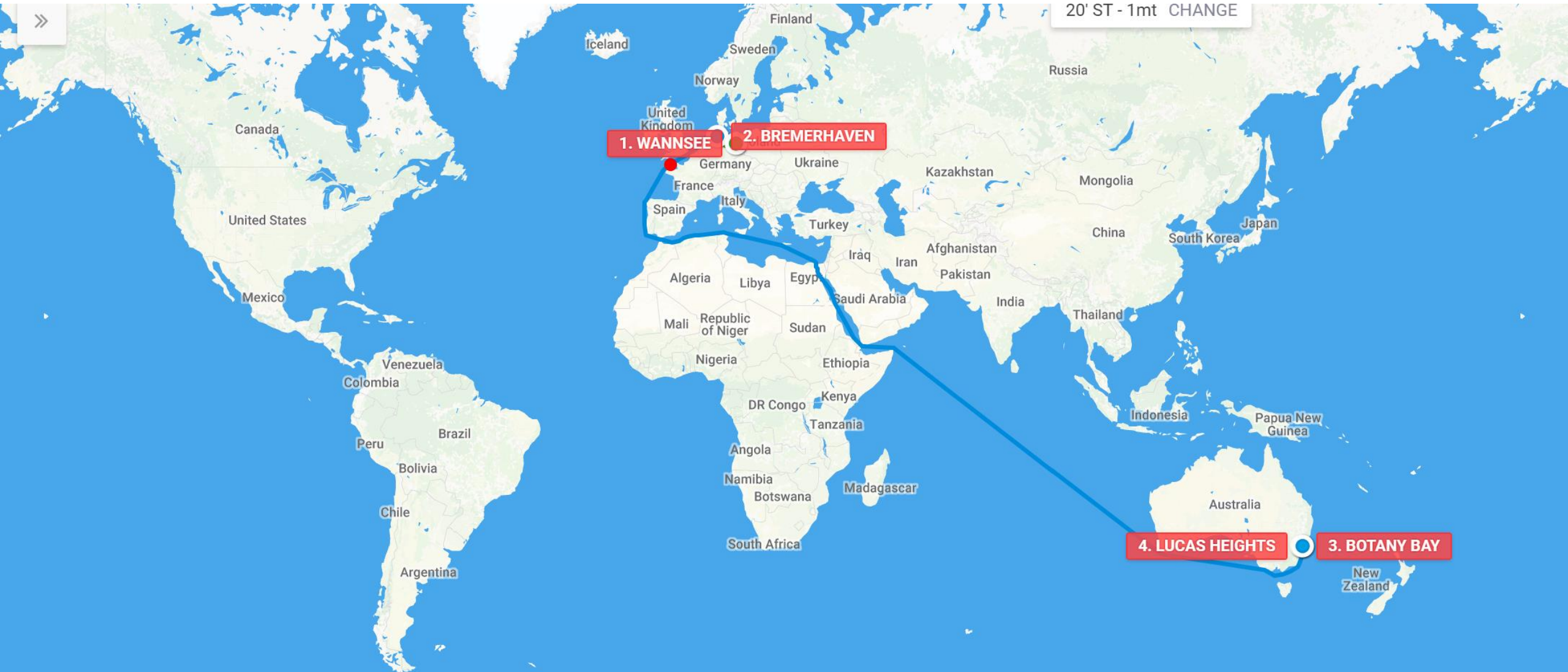
DEMIN 2018, PSI

16th September

Brief overview of Part 1

- The closure of the BER-II Research Reactor in 2020 means that the HZB are considering the transfer of their neutron scattering instruments to other institutions.
- An agreement was signed between ANSTO and HZB in September 2015 for the transfer of the BioRef reflectometer (V18) to ANSTO by December 2016.
- The agreement stipulates that ANSTO is responsible for the transfer of BioRef to Australia
- We planned with HZB to disassemble and ship the instrument in September 2016
- The instrument has been renamed SPATZ (Sparrow).

Brief overview of Part 1



What has happened since then?

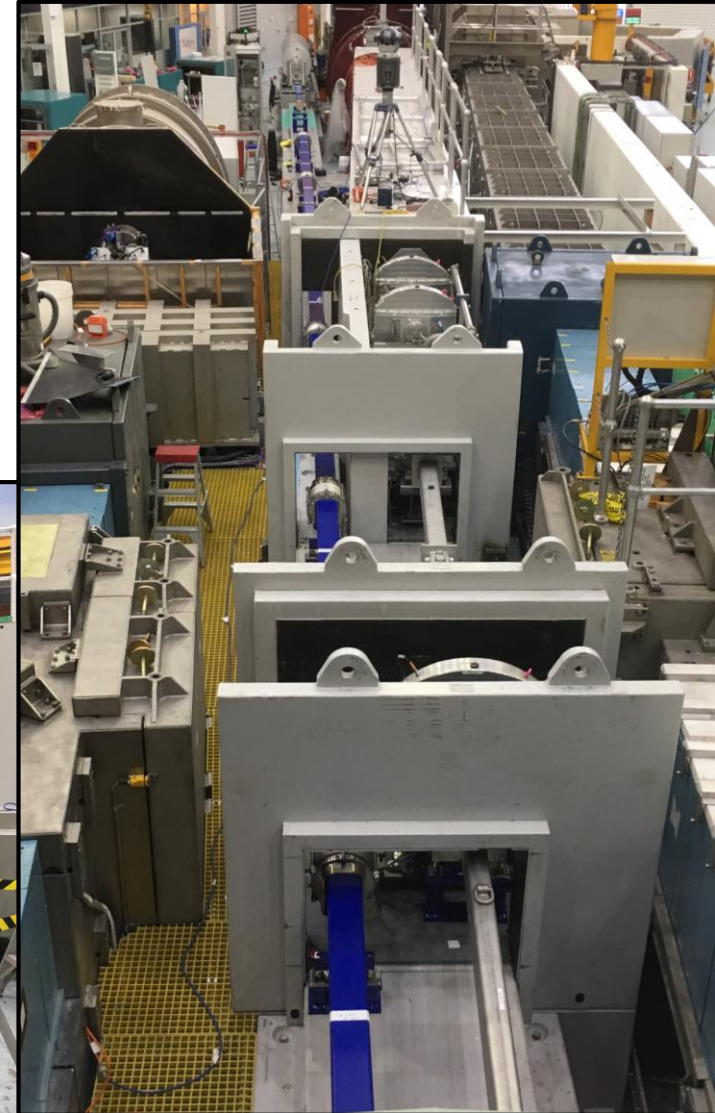
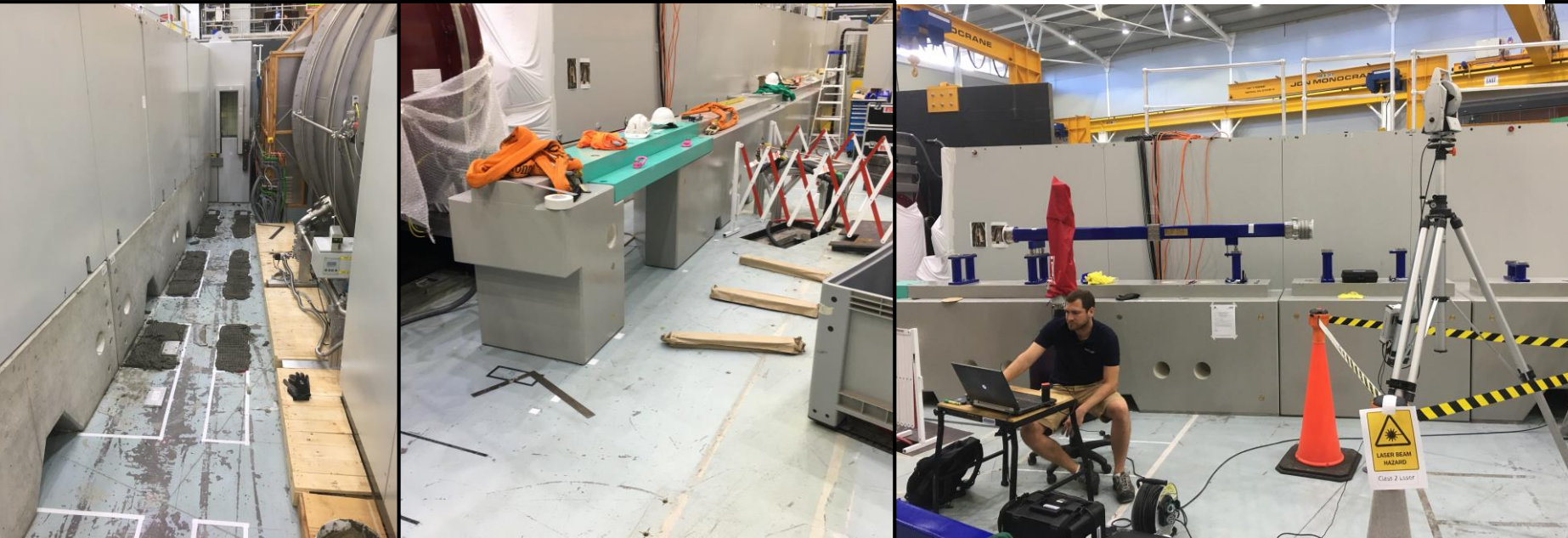
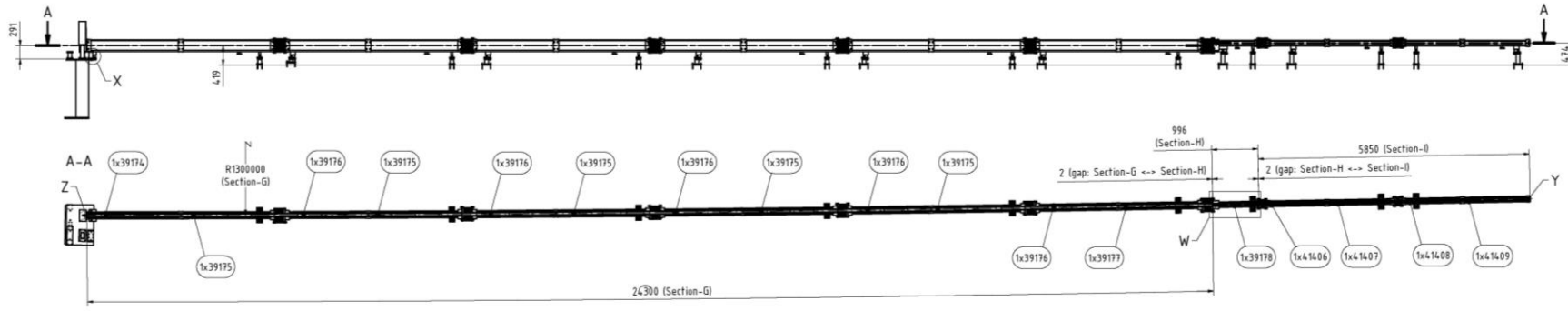
The instrument was delivered to ANSTO 9th February 2017.



What has happened since then?

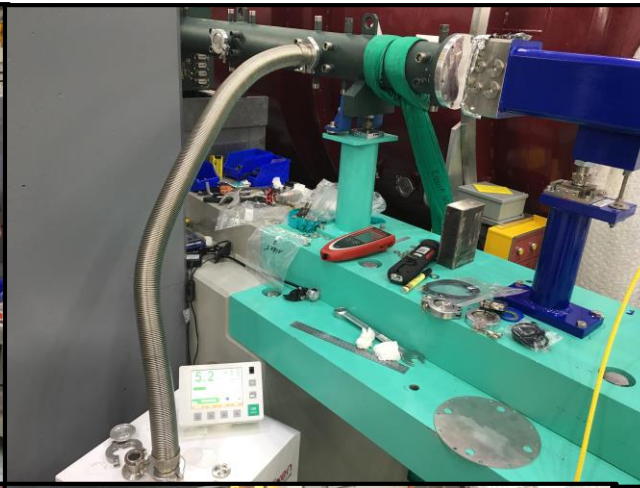
Building the CG2B beam line to feed SPATZ.

31m of guide
160X50mm m=3 top, bottom
m=2 and 2.5 sides up to 24.3m
50X30mm m=3 top, bottom
m=1 sides 24.3-31m



What has happened since then?

Installation and alignment of the SPATZ Instrument.



1. Location of the Instrument Plinth

2. Installation and commissioning of the chopper system

3. Installation and alignment of the instrument guide system

4. Installation of infrastructure

5. Installation of shielding

6. Installation of enclosure walls

7. Boron lining of enclosure walls



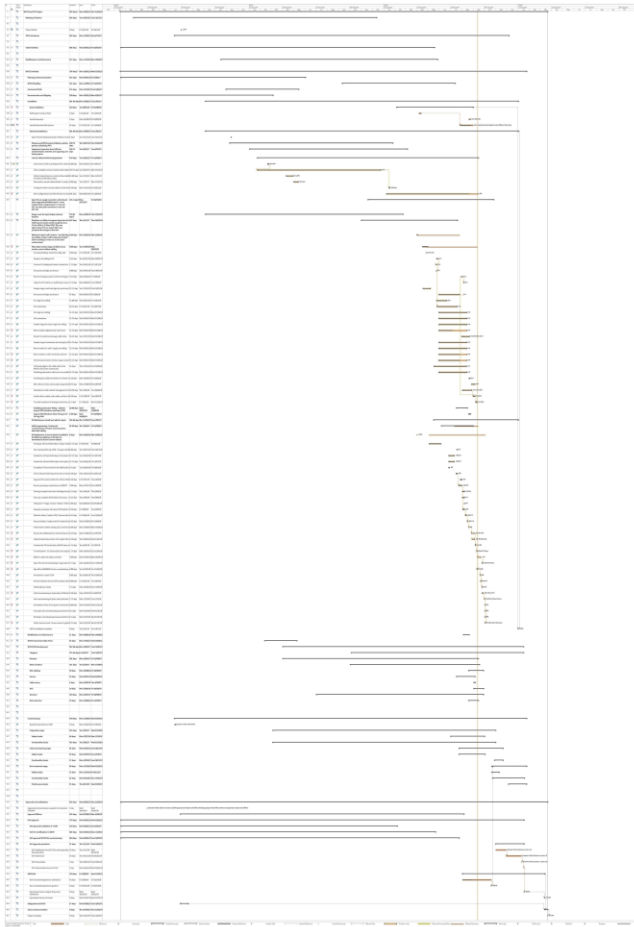
What has happened since then?



Installation and alignment of the SPATZ Instrument.



Planning

Much like the disassembly, the assembly was planned and documented with instructions.





**INSTRUCTION FOR THE
INSTALLATION OF THE CG2B
BEAMLINE EXTENSION**

**Technical Document - CG2B
Installation Instruction**

BRAGG – CG2 – WKI – 0005 - 00

November 2017

Revision: 0
Approved by: Quality Management Systems Manager
<Approved>

Effective Date: 02 June 2017
Custodian: Spatz Instrument Scientist

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**INSTRUCTION FOR THE
INSTALLATION OF THE SPATZ
INSTRUMENT**

**Technical Document - SPATZ
Installation Instruction**

BRAGG – SPATZ – WKI – 0004 - 01

November 2017

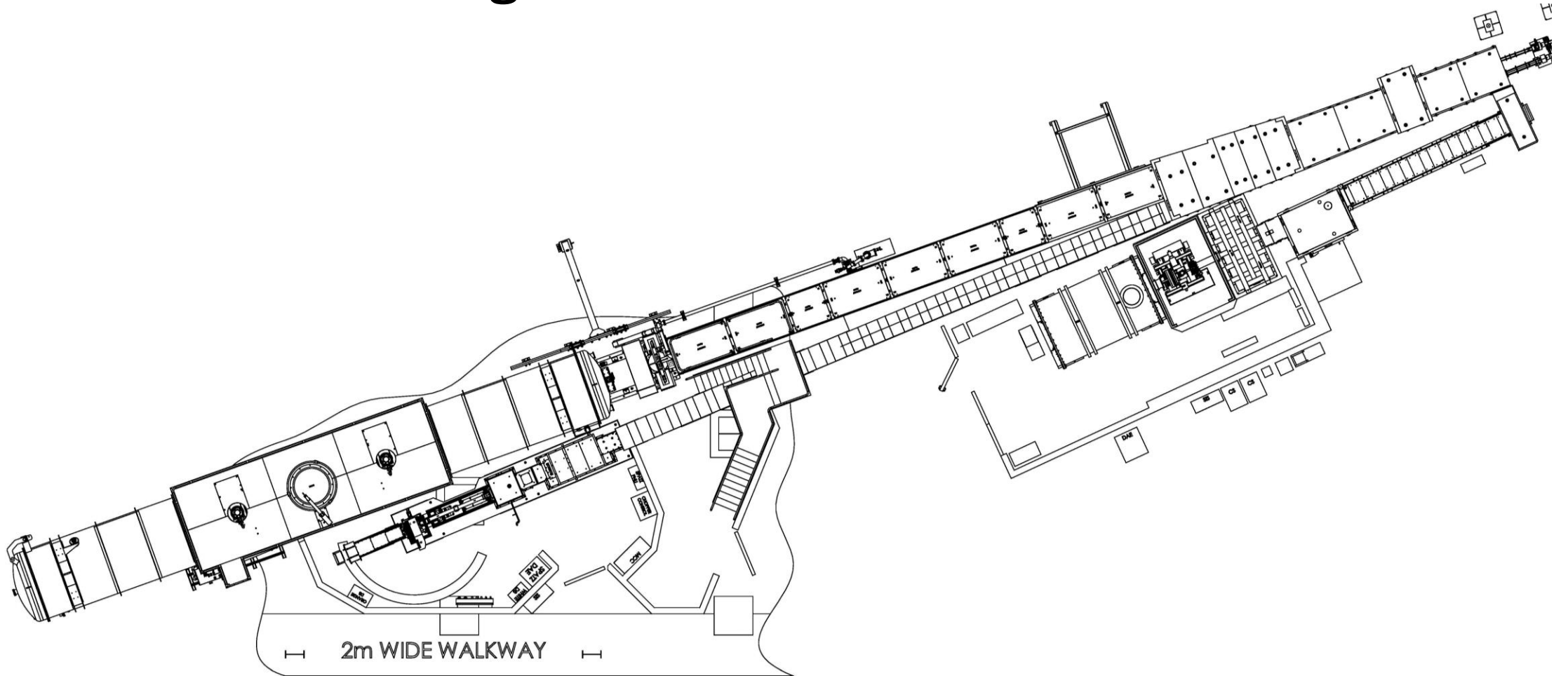
Revision: 1
Approved by: Quality Management Systems Manager
<Approved>

Effective Date: 02 June 2017
Custodian: Spatz Instrument Scientist

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Some Technical Challenges

Modification to existing infrastructure



Some Technical Challenges

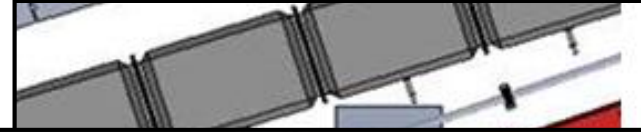
Modification to existing infrastructure

Design complied with AS1657, and associated standards.



Some Technical Challenges

Maintenance access / emergency egress for Bilby.



Some Technical Challenges

Lift Point Testing

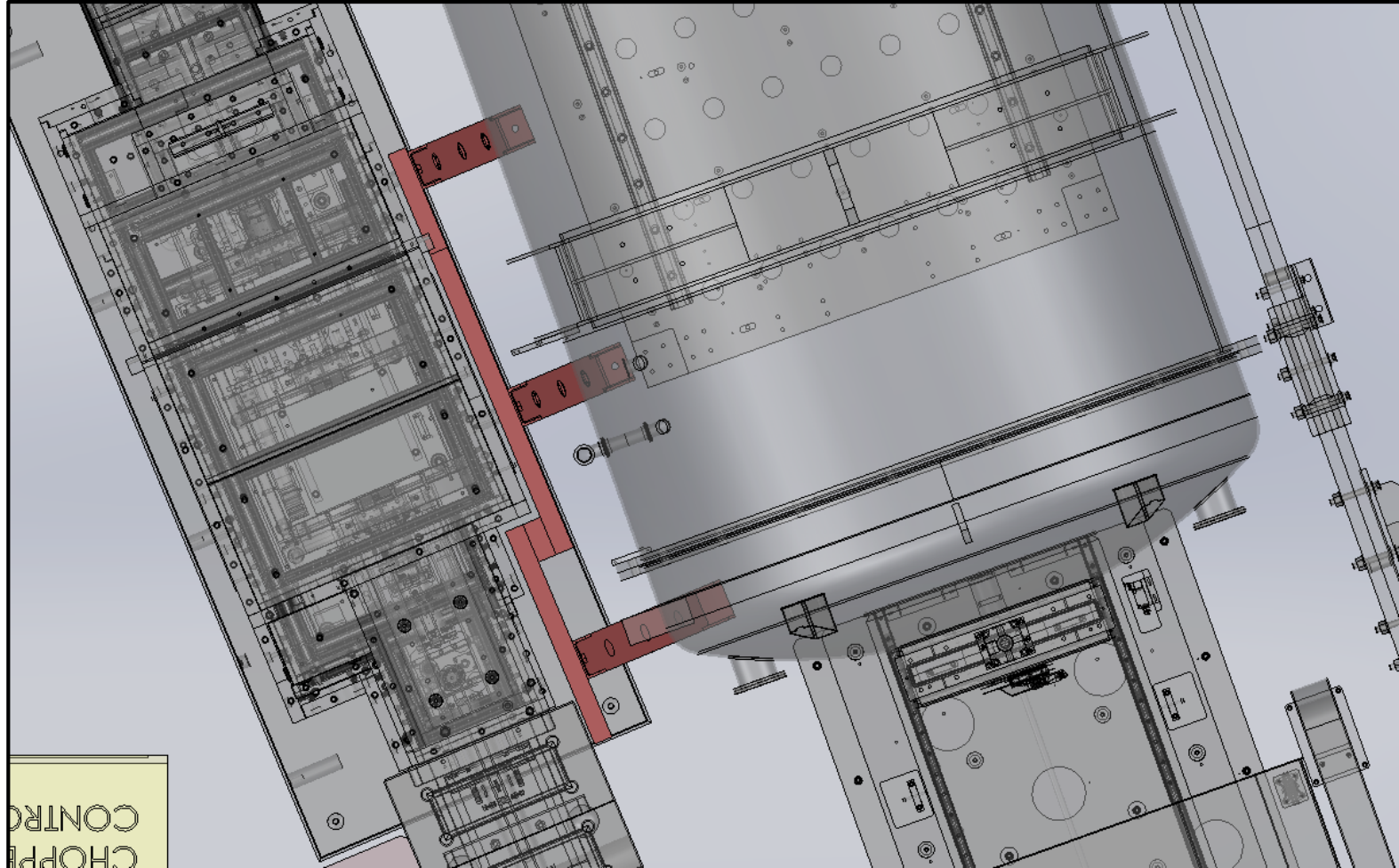
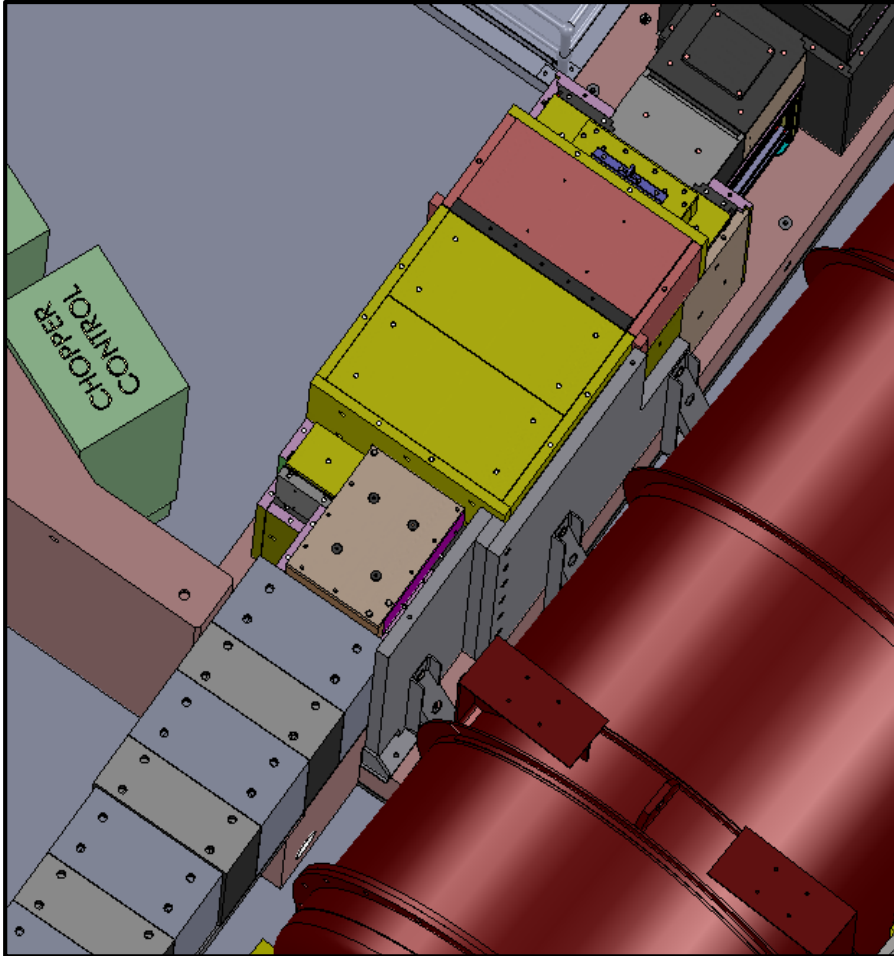
Test load = measured mass X 1.25 X 1.1

In this case measured mass = 10,600kg
Therefore test load minimum = 14,575kg



Some Technical Challenges

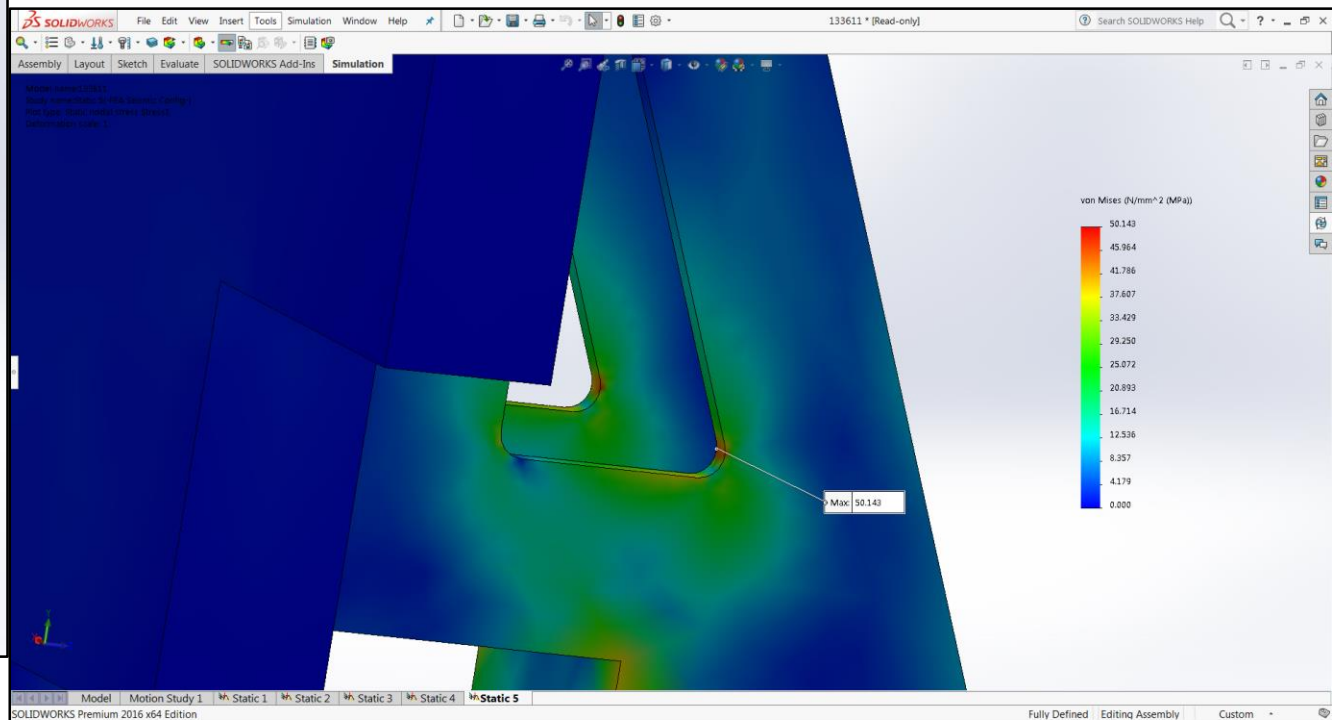
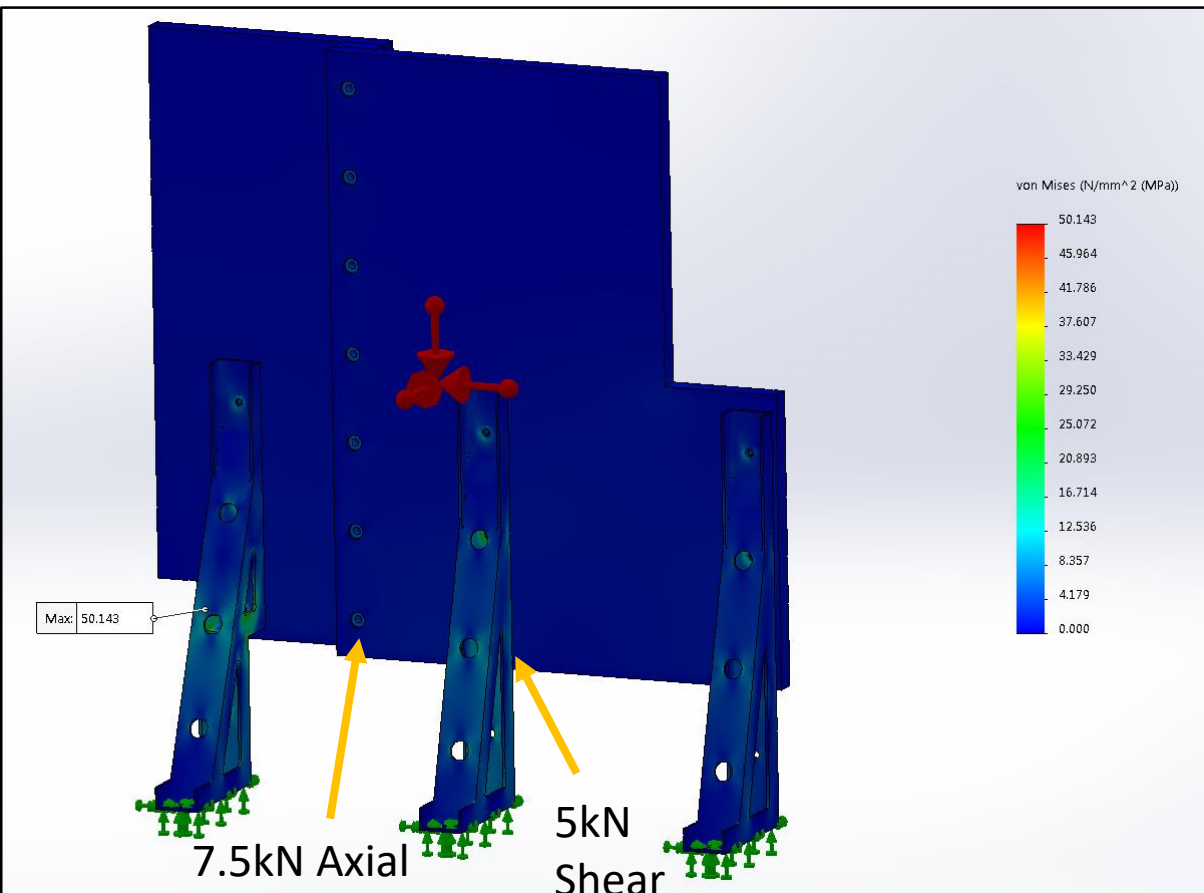
- Shielding Wall between SPATZ and Bilby



Some Technical Challenges

■ Shielding Wall between SPATZ and Bilby



Max axial Load for M20 = 98kN (Class 4.6) (AS4291)
 Max Shear for M20 calculated following von Mises
 yield criterion for pure shear = 34kN



Administrative Some Technical Challenges

Safety Approvals

One more left to gain approval for operational status of the SPATZ Instrument, to be completed Jan 2019

 
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SAFETY ASSURANCE COMMITTEE (SAC)
APPROVAL NOTICE – SAC 2039/1
BioRef Reflectometer Disassembly
HZB
Berlin Germany
One-Off Approval


Responsible Officer: Anton Le Brun
Work Activity Location: HZB, Berlin, Germany

Following an assessment of the Safety Assurance Committee (SAC) application for the disassembly of the BioRef Reflectometer as described and review of the supporting documentation, this application was approved at SAC meeting 558 on the 29th August 2016.


This approval is for the specific operations described in the application/disassembly instruction.

Any significant modification to the processes described must be referred back to the Safety Assurance Committee.

The operations described must be carried out in compliance with ANSTO's WHS Management System and the supporting documentation contained in the SAC submission.


Simon Bastin
A/Chair, Safety Assurance Committee
30 August 2016

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SAFETY ASSURANCE COMMITTEE (SAC)
APPROVAL NOTICE – SAC 2080
CG2b Guide Extension Installation
Expiry Date 15 February 2018

Responsible Officer: Anton Le Brun
Work Activity Location: B82
Neutron Guide Hall


SAC Application 2080 was approved at SAC meeting 578 on the 13 February 2018.

This approval is for the specific operations described in the application.



Any significant modification to the processes described must be referred back to the Safety Assurance Committee.

The operations described must be carried out in compliance with ANSTO's WHS Management System and the supporting documentation contained in the SAC submission.

The Responsible Officer must ensure that a formal review of the Safety Assessment and Risk Control Measures is conducted within three (3) years from the date of SAC approval.


Herin Griffiths
Chair, Safety Assurance Committee

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SAFETY ASSURANCE COMMITTEE (SAC)
APPROVAL NOTICE – SAC 2079
Modifications to the egress of instrument enclosure of BILBY


Responsible Officer: Anton Le Brun
Work Activity Location: Building 82
Neutron Guide Hall

This SAC application was approved at SAC meeting 583 on the 14 May 2018.

This approval is for the specific operations described in the application.

Any significant modification to the processes described must be referred back to the Safety Assurance Committee.

The operations described must be carried out in compliance with ANSTO's WHS Management System and the supporting documentation contained in the SAC submission.


Paula Berghofer
Acting Chair, Safety Assurance Committee

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SAFETY ASSURANCE COMMITTEE (SAC)
SAC 2081 – HOT COMMISSIONING LICENCE APPLICATION OF THE
SPATZ TIME-OF-FLIGHT NEUTRON REFLECTOMETER WITH VERTICAL SAMPLE
GEOMETRY

Responsible Officer: ANTON LE BRUN
Work Activity Location: Building 82
Rooms – Neutron Guide Hall

This SAC application was approved at SAC meeting 586 on the 18 July 2018.

This approval is for the specific operations described in the application. This submission must also be submitted to ARPANSA and their approval must be obtained prior to commencement.

Any significant modification to the processes described must be referred back to the Safety Assurance Committee.

The operations described must be carried out in compliance with ANSTO's WHS Management System and the supporting documentation contained in the SAC submission.

The Responsible Officer must ensure that a formal review of the Safety Assessment and Risk Control Measures is conducted within three (3) years from the date of SAC approval.


Mark Sumner
Chair, Safety Assurance Committee

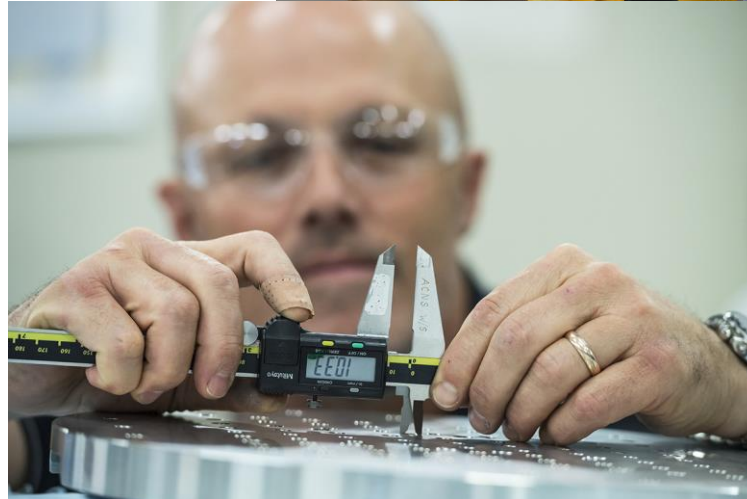
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What will happen next?

- Hot commissioning licence from our regulator ARPANSA (Oct 2019)
- Hot commissioning activities:
 - Shielding integrity testing. (Is the instrument shielded adequately?)
 - Safety system testing. (Does the SIS control access as intended?)
 - Instrument functionality/performance testing. (Does the instrument perform as expected?)
- Operating licence from our regulator ARPANSA (April 2019)
- Friendly user operations (June 2019)
- User operations (September 2019, next user round)

Project Team

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Jason Christoforidis
Andrew McGregor
David Roach
John Affleck
Matthew Bell
Martin Jones
Frank Darmann
Scott Olsen
Paris Constantine



Thank you to the HZB team for their support!



Markus Trapp
Werner Graf
Rolf Hellhammer
Roland Steitz
Anke Kaysser-Pyzalla

Companies with significant inputs!

Jülich

Felix Müller

Gregor Lang

Mirrotron

László Krisztián

Zsombor Sánta

Zsolt Ludányi

SwissNeutronics

Christian Schanzer

Nico Schäpper

Collin Mueller

Röhr + Solberg

Diemo Schallehn

Stambe Enterprises

Joe Stambe

Frank Stambe

Ulrich Aluminium

Simon Williams

Questions???

Thank you

Lessons learnt

- Engage companies as early as possible!
- Communicate communicate communicate!
- Record what actually happened during installation! (Beyond as builts)
- Don't forget fittings and fixtures when preparing activities