



EUROPEAN  
SPALLATION  
SOURCE

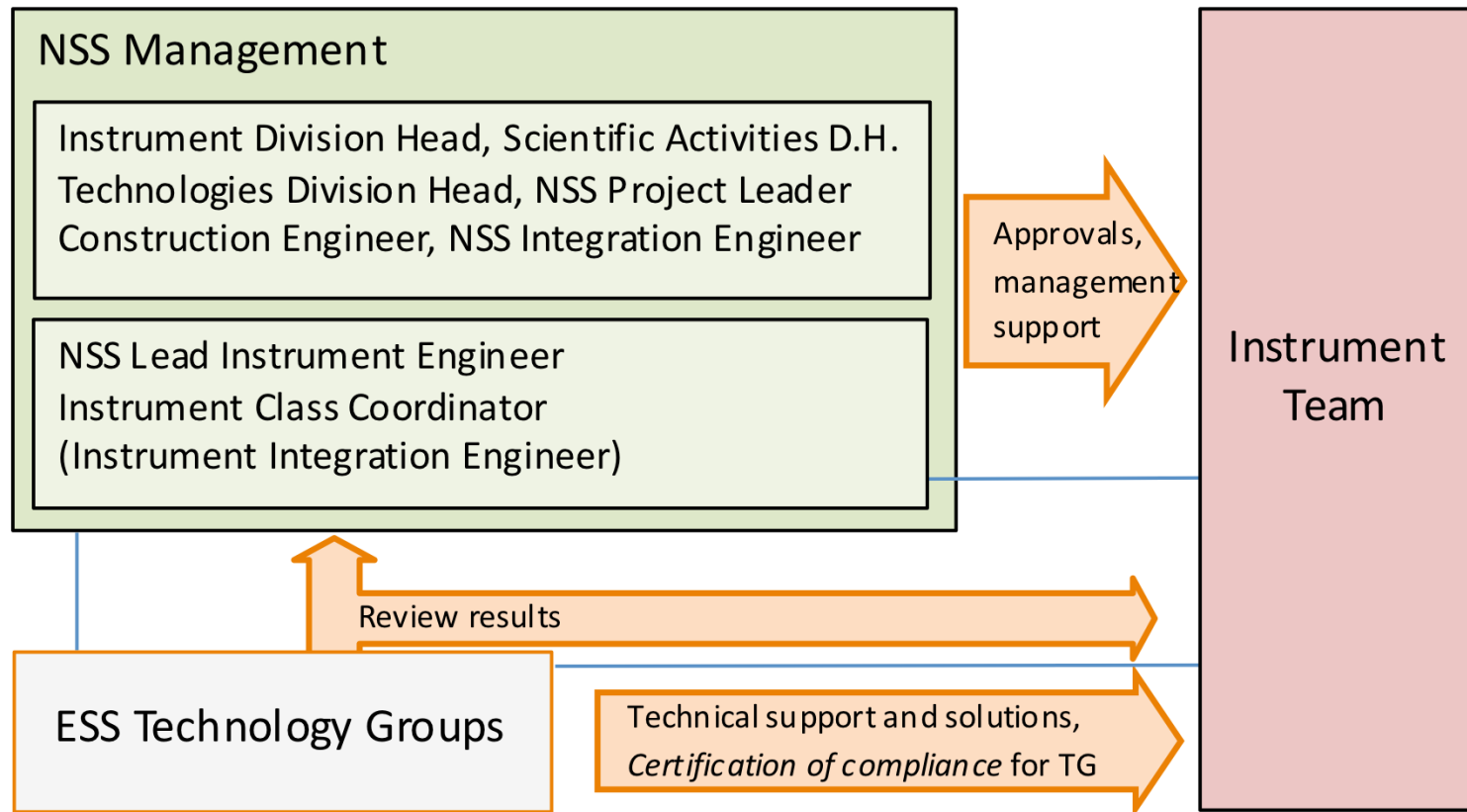
# Instrument Design Support

Gábor László

NSS Lead Instrument Engineer

# Management Structure

From instrument design perspective!



# NSS Management

**NSS Project Leader: Shane Kennedy**



**Technologies Division Head: Oliver Kirsten**  
Leading technology groups, Deputy NSS Project Leader

**Scientific Activities Division Head: Arno Hiess**  
Licensing, Sample Environment, Labs, User offices



**Instrument Division Head: Ken Andersen**  
Instrument coordination /Science/

**NSS Lead Instrument Engineer: Gabor Laszlo**  
Instrument coordination /Engineering/



## **NSS Construction Engineer**

- Coordination of civil construction activities
- NSS Safety and Licensing
- Assembly and installation of key NSS equipment

## **NSS Integration Engineer**

- Radiation shielding and protection systems
- Integration planning for the installation and commissioning

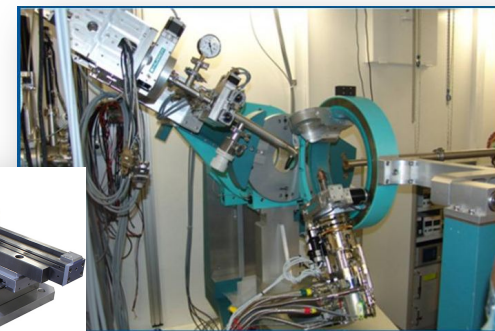
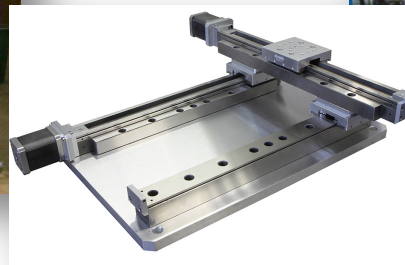
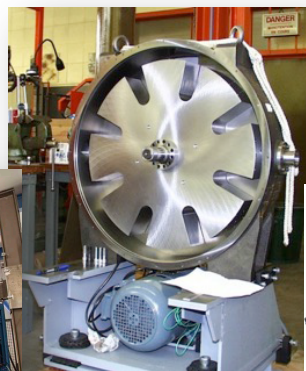
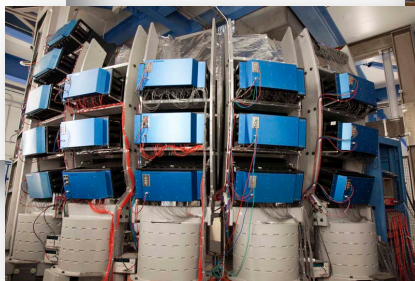
## **Instrument Class Coordinator**

- Point of contact with ESS Communications
- Organizing meetings
- Coordinate within instrument class
- Scientific support to the Instrument Teams

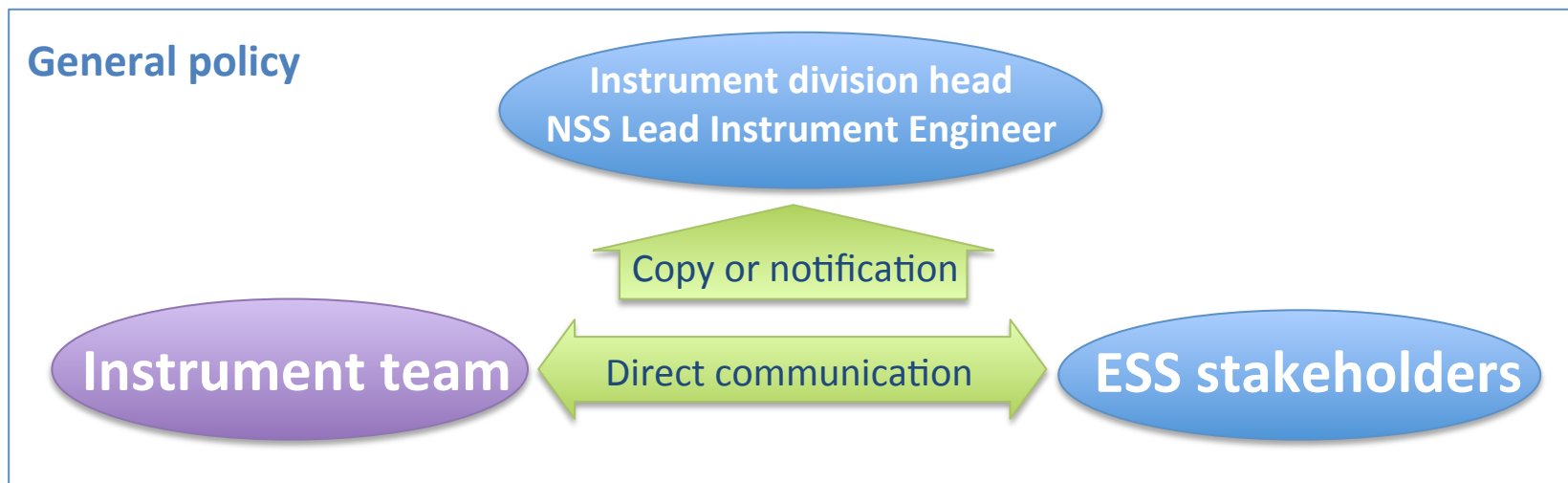
# ESS Technology Groups

## ESS Technology groups

NOSG (Shielding & Optics)	Vacuum Group	CF (Architecture)
Detector Group	Integration Group	ICS (Instrument Control System)
Chopper Group	PLM & Process Support Group	Protection Systems Group
Motion Control Group	Survey Group	CAD & IT
Sample Environment	Cooling	System Engineering & QA



# NSS Communication policy



- The Instrument Teams should share the developing technical documentation from the earliest stage on Confluence. This way the Technology Groups can follow the progress of the design both in CHESS (CAD model), and on Confluence in order to give a timely feedback, if they realize any potential problem with the design. In order to facilitate it the Instrument Engineer shall inform the Technology Groups about any relevant uploaded document. If the primary 3D model of the instrument is not created in CATIA v6 then the Instrument Team should update the CATIA model in CHESS monthly, so the Technology Groups can follow and advise about the construction.
- The instrument projects shall discuss the choices of the technologies with the related Technology Groups and they have to be approved by the NSS Project management through the Lead Instrument Engineer.



# NSS Management roles and responsibilities



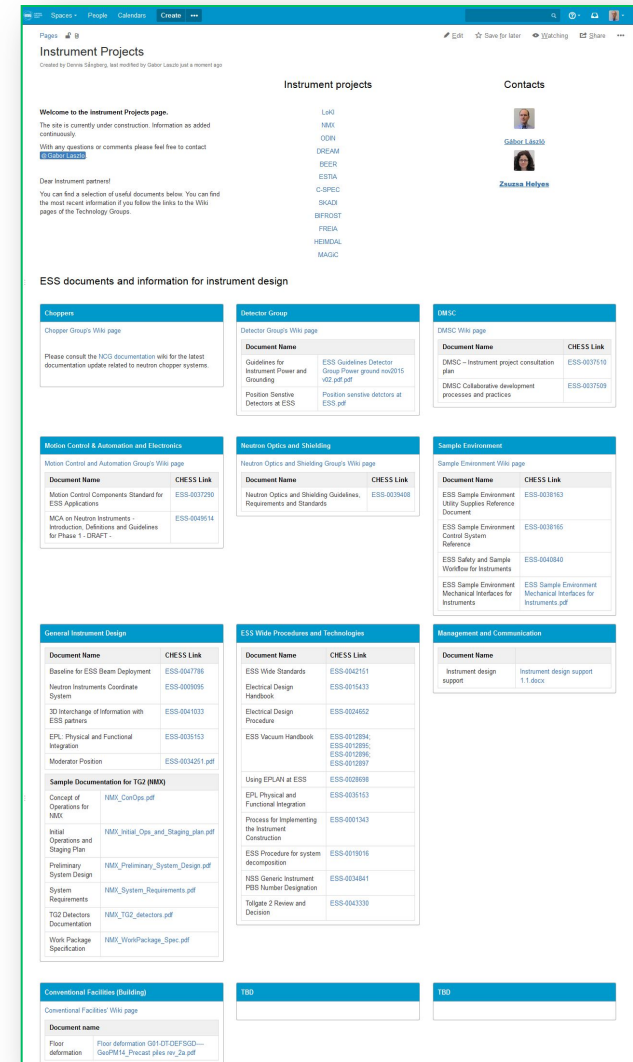
- Provide direction and advice to instrument projects
- Co-ordination and facilitation of the design and construction of the ESS neutron scattering instruments
- Coordinate the software needs for the instrument suite.
- Manage the development of the laboratory and Sample Environment needs for the instrument suite.
- Support communication with technology groups, CAD methodology and PLM efforts
- Perform risk reviews and manage risks across the suite. Give the classification method for risk classification.
- Ensure that all work is planned and executed in accordance with ESS quality assurance and SHE policies and procedures
- Manage and coordinate the instrument STAP meetings and tollgate reviews
- Ensure design reviews are conducted as appropriate



# NSS Management roles and responsibilities

## 1. Provide direction and advice to instrument projects

- Provide framework for collaboration
- Support information exchange



The screenshot shows the "Instrument Projects" page on the ESS Confluence site. The page includes a welcome message, a list of instrument projects, and a table of documents and information for instrument design.

**Instrument projects**

Instrument projects	Contacts
LARI	LARI
MMX	MMX
ODIN	ODIN
DREAM	DREAM
BEER	BEER
ESTIA	ESTIA
G-SPEC	G-SPEC
SKADI	SKADI
WINDST	WINDST
PHIA	PHIA
HEIMDAL	HEIMDAL
MAGIC	MAGIC

**ESS documents and information for instrument design**

Document Name	CHES Link
Chopper Group's Wiki page	
Phase consult the NCS documentation who for the latest documentation update related to neutron chopper systems	
Detector Group's Wiki page	
Detector Group's Wiki page	
Document Name	CHES Link
Guidelines for Instrument Power and Grounding	ESS-0037290
Position Sensitive Detector at ESS	ESS-0037290
DMSC - Instrument project consultation plan	ESS-0037116
DMSC Collaborative development processes and practices	ESS-0037508
Motion Control & Automation and Electronics	
Motion Control and Automation Group's Wiki page	
Document Name	CHES Link
Motion Control Components Standard for ESS Applications	ESS-0037290
MCA on Neutron Instruments - Introduction, Definitions and Guidelines for Phase 1 - DRAFT -	ESS-0040514
Neutron Optics and Shielding	
Neutron Optics and Shielding Group's Wiki page	
Document Name	CHES Link
Neutron Optics and Shielding Guidelines, Requirements and Standards	ESS-0034008
Sample Environment	
Sample Environment Wiki page	
Document Name	CHES Link
ESS Sample Environment User's Guide Reference Document	ESS-0038163
ESS Sample Environment Control System Reference	ESS-0038165
ESS Safety and Sample Workflow for Instruments	ESS-0040840
ESS Sample Environment Mechanical Interfaces for Instruments	ESS-0040840
General Instrument Design	
Document Name	CHES Link
Baseline for ESS Beam Deployment	ESS-0047786
Neutron Instruments Coordinate System	ESS-0000095
2D Interchange of Information with ESS partners	ESS-0041033
EPL Physical and Functional Integration	ESS-0035163
Moderator Position	ESS-0034251.pdf
Sample Documentation for TG2 (MMX)	
Concept of Operations for MMX	MMX_ConOps.pdf
Initial Operations and Staging Plan	MMX_Initial_Ops_and_Staging_plan.pdf
Preliminary System Design	MMX_Preliminary_System_Design.pdf
System Requirements	MMX_System_Requirements.pdf
TG2 Detectors Documentation	MMX_TG2_detectors.pdf
Work Package Specification	MMX_WorkPackage_Spec.pdf
ESS Wide Procedures and Technologies	
Document Name	CHES Link
ESS Wide Standards	ESS-0042151
Electrical Design Handbook	ESS-0015433
Electrical Design Procedure	ESS-0024652
ESS Vacuum Handbook	ESS-0012894
ESS-0012895	ESS-0012895
ESS-0012897	ESS-0012897
Using EPLAT at ESS	ESS-0028698
EPL Physical and Functional Integration	ESS-0035163
Process for Implementing the Instrument Construction	ESS-0001343
ESS Procedure for system decomposition	ESS-0016016
NSS Generic Instrument PPS Number Designation	ESS-0034841
Table 2 Review and Decision	ESS-0043338
Conventional Facilities (Building)	
Conventional Facilities Wiki page	
Document name	
Floor deformation	Floor deformation 001-07-DEF500 - CuspM14_Precast plus rev. 2a.pdf
TSD	
TSD	

# Collaboration Framework

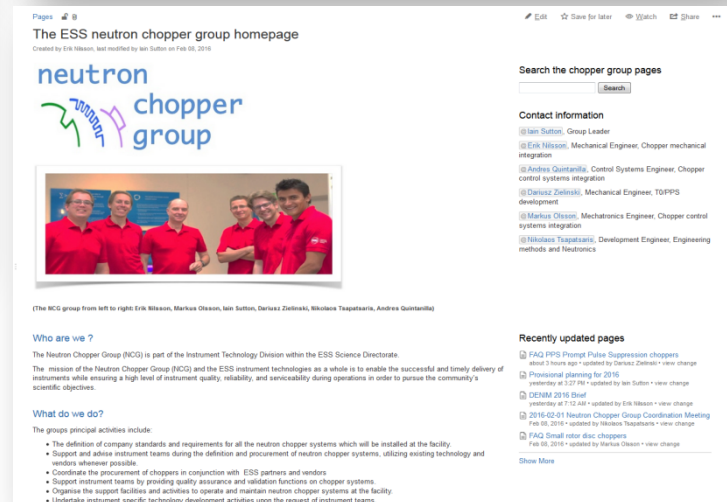
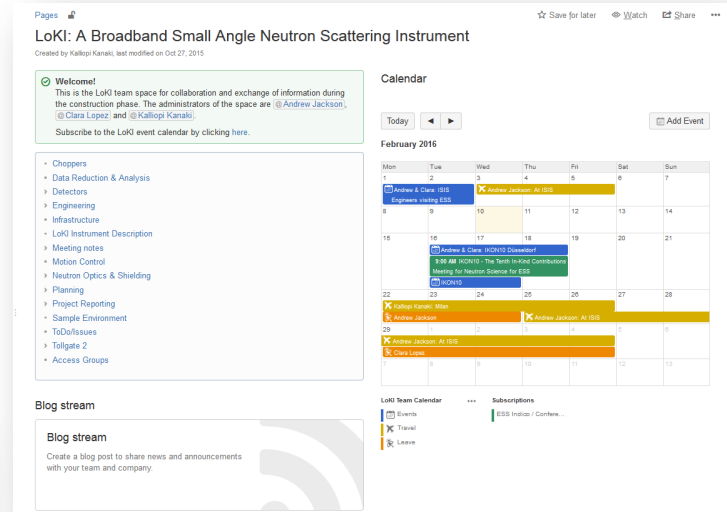
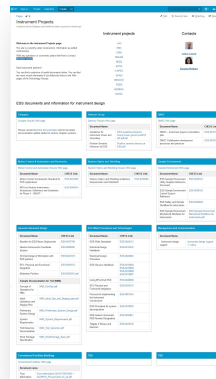


## CONFLUENCE

It is a suite of collaborative tools designed and marketed by Atlassian.  
It integrates with the project & tracking system **JIRA**.

With these tools you can create:

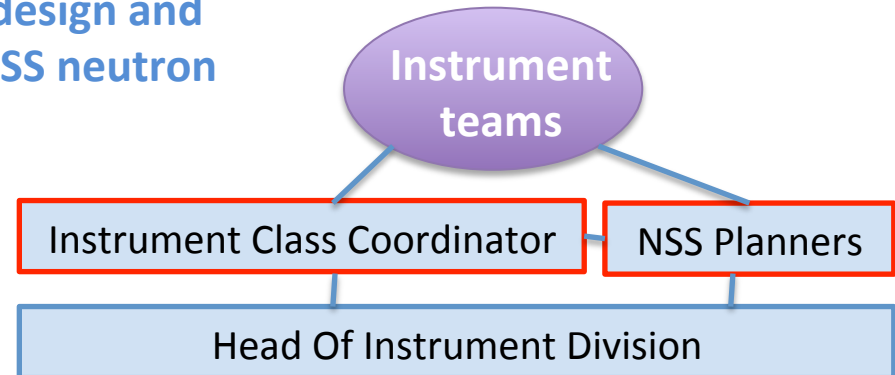
- WIKI type webpages
- meeting minutes,
- Calendars
- Blogs
- Task tracking
- Document sharing and tracking



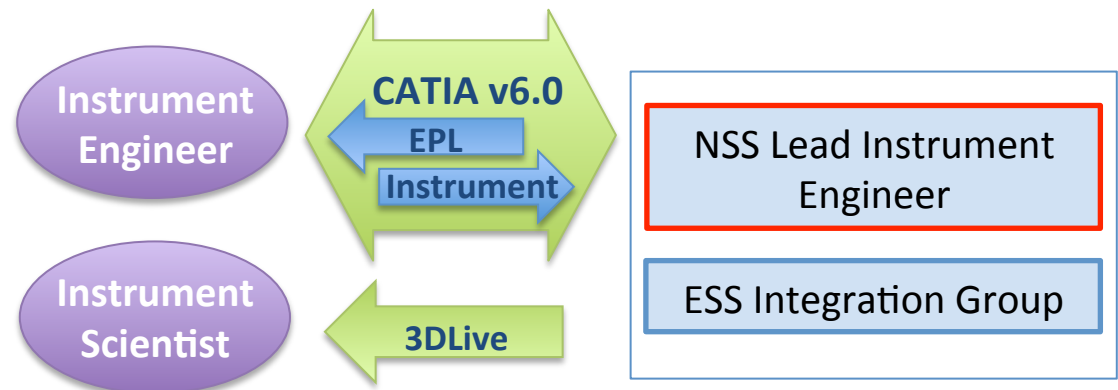
# NSS Management roles and responsibilities

## 2. Co-ordination and facilitation of the design and construction and integration of the ESS neutron scattering instruments

- Provide direction and support to the instruments projects to remain within scope, cost and schedule

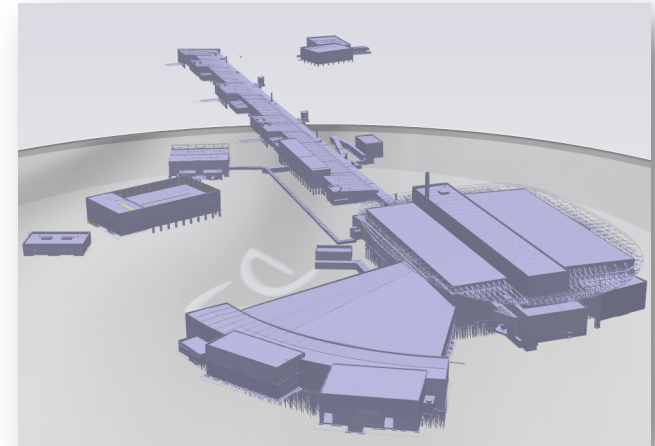


- Manage design integration



# NSS Management roles and responsibilities

EPL (ESS Plant Layout) is the top level 3D CAD master model of the whole ESS facility. It depicts the physical arrangement of equipment, buildings, and any related infrastructure within the ESS site.



- Lead the integration planning for the installation and commissioning phase of the instruments.

NSS Management

NSS Construction  
Engineer, Planners

Instrument  
teams

# NSS Management roles and responsibilities

## 3. Support communication

Contact list in Confluence

OR

NSS Lead Instrument Engineer,  
Instrument Division Head

Pages / Science Directorate Home

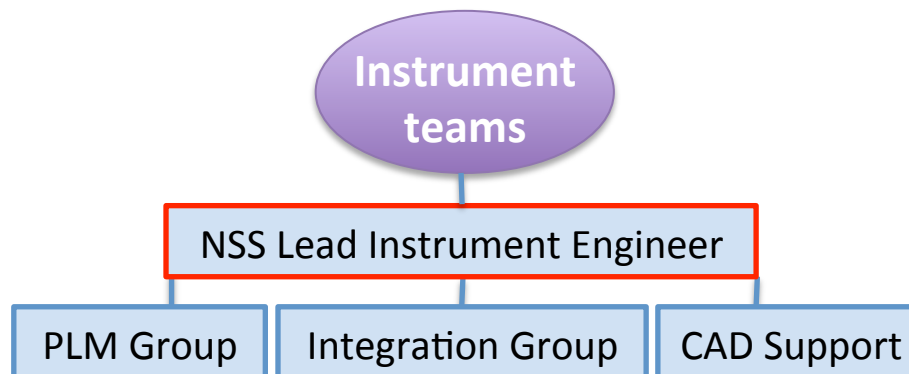
### CONTACTS

Created by Mads Elvege, last modified by Erik Nilsson on Jan 27, 2016

INSTRUMENT	Endorsement	phase 0	phase 1	lab	team contact	lead engineer	ESS contact	SAD contact	Detector contact	MCA contact	Chopper contact	DMSC Contact
LOKI	2013		2014	ESS (ISIS)	A Jackson	C Lopez	A Jackson	A Pettersson	K Kanaki	A Sandström	@ Erik Nilsson	@ Jonathan Taylor
SKADI	2014		2015	FZJ (LLB)	S Jaskoch / H Frielinghaus		A Jackson	A Pettersson	K Kanaki	A Sandström	@ Nikolaos Tsapatsaris	@ Jonathan Taylor
ESTIA	2014		2015	PSI	A Glavic	S Schütz	H Wacklin	Z Fisher	F Piscitelli	D Fitzgerald	@ Dariusz Zielinski	@ Jonathan Taylor
FREIA	2014	2015		ESS (ISIS)	H Wacklin		H Wacklin	Z Fisher	F Piscitelli		@ Erik Nilsson	@ Jonathan Taylor
ODIN	2013		2014	ESS (TUM)	M Strobl		M Strobl	M Guthrie	T Blys	D Fitzgerald	@ Nikolaos Tsapatsaris	@ Thomas Holm Rod
BEER	2014		2015	HZGREGZ	A SchreyerP Lukas		M Strobl	M Guthrie	I Stefanescu	P Barron	@ Erik Nilsson	@ Thomas Holm Rod
HEIMDAL	2014	2015		Anhus	M Christensen		P Henry	M Guthrie	R Hall-Wilton		@ Erik Nilsson	@ Thomas Holm Rod
DREAM	2014		2015	FZJ	W Schweika	P Harbott	P Henry	M Guthrie	I Stefanescu	A Sandström	@ Dariusz Zielinski	@ Thomas Holm Rod
NMX	2013		2014	ESS (IBS)	E Oksanen	G Aprigliano	E Oksanen	Z Fisher	D Pfeiffer	P Barron	@ Markus Olsson	@ Thomas Holm Rod
MAGIC	2015	???		LLB	@ Xavier Fabriges		W Schweika	@ Alex Holmes		P Barron	@ Nikolaos Tsapatsaris	@ Thomas Holm Rod
BIFROST	2014	2015		DTU	N Bech Christensen		P Deen	@ Alex Holmes			@ Markus Olsson	@ Jonathan Taylor
MIRACLES	2015	???		NBI	H N Bordinello		P Deen	H Schneider			@ Markus Olsson	@ Jonathan Taylor
VESPA	2015	???		CNR-ISC	L Ulivi		P Deen	M Hartl			@ Markus Olsson	@ Jonathan Taylor
C-SPEC	2014		2015	TUM (LLB)	P Deen	J Guyon-le Bouffay	P Deen	H Schneider	A Khaplanov	D Fitzgerald	@ Nikolaos Tsapatsaris	@ Jonathan Taylor
T-REX	2015	???		FZJ	J Voigt		P Deen	@ Alex Holmes		A Sandström	@ Dariusz Zielinski	@ Jonathan Taylor
VOR	2014	2015		ESS (Wigner Institute)	P Deen		P Deen	H Schneider	A Khaplanov			@ Jonathan Taylor

instrument | instruments

## 4. Support CAD methodology and PLM efforts



Instrument Projects

ESS documents and information for instrument design

Instrument Name	Instrument Project	Contacts
LOKI	LOKI	@ Erik Nilsson
SKADI	SKADI	@ Jonathan Taylor
ESTIA	ESTIA	@ Jonathan Taylor
FREIA	FREIA	@ Jonathan Taylor
ODIN	ODIN	@ Jonathan Taylor
BEER	BEER	@ Jonathan Taylor
HEIMDAL	HEIMDAL	@ Jonathan Taylor
DREAM	DREAM	@ Jonathan Taylor
NMX	NMX	@ Jonathan Taylor
MAGIC	MAGIC	@ Jonathan Taylor
BIFROST	BIFROST	@ Jonathan Taylor
MIRACLES	MIRACLES	@ Jonathan Taylor
VESPA	VESPA	@ Jonathan Taylor
C-SPEC	C-SPEC	@ Jonathan Taylor
T-REX	T-REX	@ Jonathan Taylor
VOR	VOR	@ Jonathan Taylor

# NSS Management roles and responsibilities

5. Perform risk reviews and manage risks across the suite. Give the classification method for safety classification.
6. Coordinate the software needs for the instrument suite.
7. Manage the development of the laboratory and Sample Environment needs for the instrument suite.
8. Ensure that all work is planned and executed in accordance with ESS quality assurance and ESNH policies and procedures
9. Manage and coordinate the instrument STAP meetings and tollgate reviews, ensure design reviews are conducted as appropriate



# ESS Technology Group roles and responsibilities



- **Provide the standards and interactions with common interfaces related to the respective area of the group.**
- **Review of the Preliminary System Design Document (TG2) and the Final System Design Document (TG3). The scope of the Technical Group review shall be the following:**
  - Verification of the analyses methods. (Not necessarily the result of the analyses!)
  - Validation of materials.
  - Ensure that the design and procedures comply with the applicable ESS standards and requirements.
  - Checking the feasibility of the suggested design solutions.
  - Checking the budget completeness. Technology Groups need not check all the values in the budget, only the deliverables of the quotations.  
Nevertheless the Technology, since some of the items will be developed during the instrument design. Nevertheless the Technology Groups should advise on the price of the known technologies.

# ESS Technology Group roles and responsibilities



- Review and advise on relevant instrument design and documentation. Technology Groups also provide the evaluation criteria for the document review.
- Support for system integration and commissioning, coordinated by The NSS Construction engineer.
- Supervise Factory Acceptance Tests, and participate in the QA process if they deem it necessary.
- **Provide technical support services for quality assurance, factory acceptance testing etc. as requested and paid for by the Instrument Team if necessary.**
- **Provide functional technical support activities to instrument construction projects for installation and commissioning as requested and paid for by the Instrument Team if necessary.**
- **Create documents and detailed analyses as requested and paid for by the Instrument Team if necessary.**



# Communication tools



## **Video conference**

Preferred tool: Skype / Vidyo

## **E-mail**

ESS client: MS Outlook

## **CHESS (Collaboration Home ESS)**

PLM (Product Lifecycle Management) System for ESS. This should be the repository of all the official documents of the project. It also contains all the CATIA models. NSS intention is to use CHESS for inside documents, and CATIA models.

## **CONFLUENCE**

Instrument teams will get administrator rights in their own instrument folder, so they will be able to customize the related confluence space.

Instrument partners should use Confluence for uploading documents, and also all the important ESS documents will be accessible via Confluence. NSS will upload your approved documents to chess after Tollgate Reviews.

## **CATIA**

For 3D-modelling of machine equipment, piping, cable routing and arrangement drawings CATIA v.6 is used within the ESS. The partners should also use CATIA for design. If the partner is using different CAD system, the model has to be migrated to CATIA v.6 and updated monthly. The Integration group and the NSS Lead Instrument Engineer shall be notified after each update.

ESS borrows 1 license for the partner until the finalization of the contract.

## **AccESS Portal**

This is a portal for ESS Intranet.

- Latest day-by-day news about ESS
- Upcoming events
- Search for various kinds of ESS information
- Useful pages /e-Nav, CHESS, Phonebook, ESSnow

## **ESSnow Portal**

This is a portal for asking questions or requesting services from ESS IT to procurement and HR.