

Target Overview

TAC 18

Mark Anthony
Head of Target Division

www.europeanspallationsource.se

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- Target Project Performance
- Project Accomplishments
- In-kind Status
- Technical Progress of Work Packages
- License Application update
- Issues
- Concluding Remarks

Target Project is 40% complete

- Current budget at completion for the ESS Target Sub-project is 189.7M€
 - Whereof secured in-kind contributions add up to 73M€
- Earned value as of September 2018 is 74M€
 - Cumulated Schedule Performance Index is 0.96
 - Actual cost spent as of September is 75M€, Cost performance index 0.96
 - Rebaseline changes to P6 are complete
- Preliminary Design Phase is 90% completed, 5 remaining
- Final Design (CDR's) is well underway for most systems, 43 remaining out of 79.

Recent Accomplishments

- ✓ Several big in-house & in-kind procurements ongoing; Tuning Beam Dump, Proton Beam Drift Room, Port Blocks, Inner/Outer shielding
- ✓ Awarded Monolith Vessel, Baseplates, Neutron Beam Port Insert prototype, several TSS components.
- ✓ Beryllium raw material inspected and delivered to Moscow for machining
- ✓ Pre FAT inspections completed for MRP
- ✓ Target tungsten bricks manufacturing finalized.
- ✓ Agreement with FZ Jülich to take onboard Target monitoring plug and Neutron beam extraction system.
- ✓ TMCP compressors installed
- ✓ Delivery of the Target Moderator Cryoplant (TMCP) Coldbox.

Progress with work packages

- WP2;
 - **Target Monitoring Plug** – PDR conducted successfully, and now working with Julich
 - **Helium cooling system** – on track overall, filter design was delayed
 - **Target Wheel** – prototyping completed, cassettes and W bricks delivered
 - **Monolith Shielding** – Conducting OCT, delivery during 2019
 - **Tuning Beam Dump** – Delivery and installation May 2019
- WP3;
 - **Moderator & Reflector systems** – On track, FAT end of Dec 2018, then storage
 - **Irradiation Module** – work is finalized and module installed in MRP
 - **Neutron beam extraction system** – Large system has been divided in several smaller packages, pre-CDR complete, working with Julich to build prototype.
- WP4;
 - **Monolith Vessel, Proton Beam Window, Proton Beam Instrumentation Plug** – vessel awarded,
 - **Monolith Atmosphere System** – Decision taken for pursuing rough vacuum as primary operation mode, system solution de-scoped to a simpler vacuum system, AD taking over.
- WP5;
 - **Fluid systems** – CDRs completed, procurements in progress, deliveries begin late 2019
 - Work for electrical infrastructure and cable routing coordination has been budgeted and added to scope

Progress with work packages

- WP6;
 - **Active Cells Facility (ACF)** – Poured first heavy concrete in active cells facility, all walls up to half height have been cast, now working on 2nd level
 - **ACF Liner package** – cast-in items are manufactured and delivered to site as needed for installation
 - **Mock-Up and Test Stands** – Preparations on-going for release as open call for tender
 - **Shielded Transfer Casks** – feasibility study in progress with 3 suppliers, will award q1 2019
 - **Active Cells Facility** – High Density Concrete is poured at site, about half of the systems have passed CDR
- WP7;
 - **Target Safety System TSS** – Coordinated updating of accident analyses, update of several accident analyses for operations are on-going, maintenance accident analyses have been initiated
- WP7;
 - **Additional scope elements** – conventional worker safety analyses and risk analyses, development of frameworks for I&C systems, e.g. classification, component validation and qualification, etc
- WP8;
 - **Target Physics** – Volumetric heat loads, radionuclide inventories, shielding and radiation streaming
 - **Material handbook** – continuously updated based on knowledge acquired through collaborations with partner labs
 - **Tungsten release factors** – Final results reported in April, accepted by the regulator.

Recent Accomplishments

Delivery of the Target Moderator Cryoplant (TMCP) Coldbox.



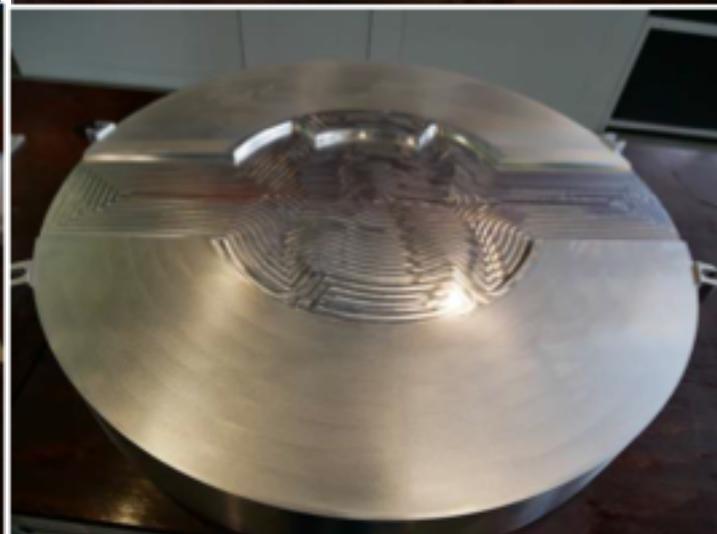
Highlights

- Raw material for the prototype Insert arrived in Jülich on Thursday 30th Aug



Highlights

Completed
Reflector parts
awaiting
Beryllium to
arrive



Progress on Construction

Casting of Utility Building floor level 100



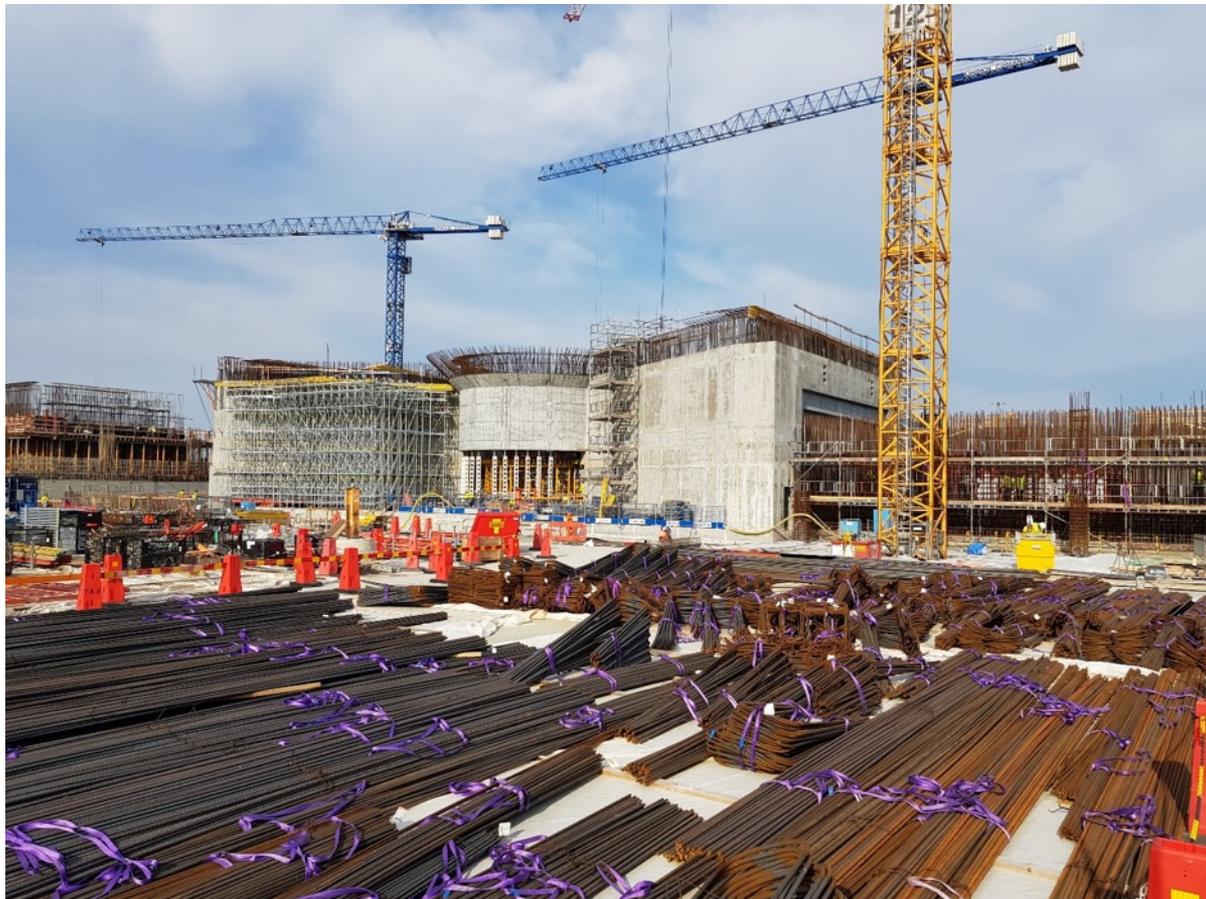
Progress on Construction

Preparation for casting of second level of Process Cell



Progress on Construction

A small part of the rebars waiting to be installed in the Highbay slab



Progress on Construction

Preparations for Highbay slab on the Monolith building



Progress on Construction

Supports for circular walls in monolith during concrete curing



Progress on Construction

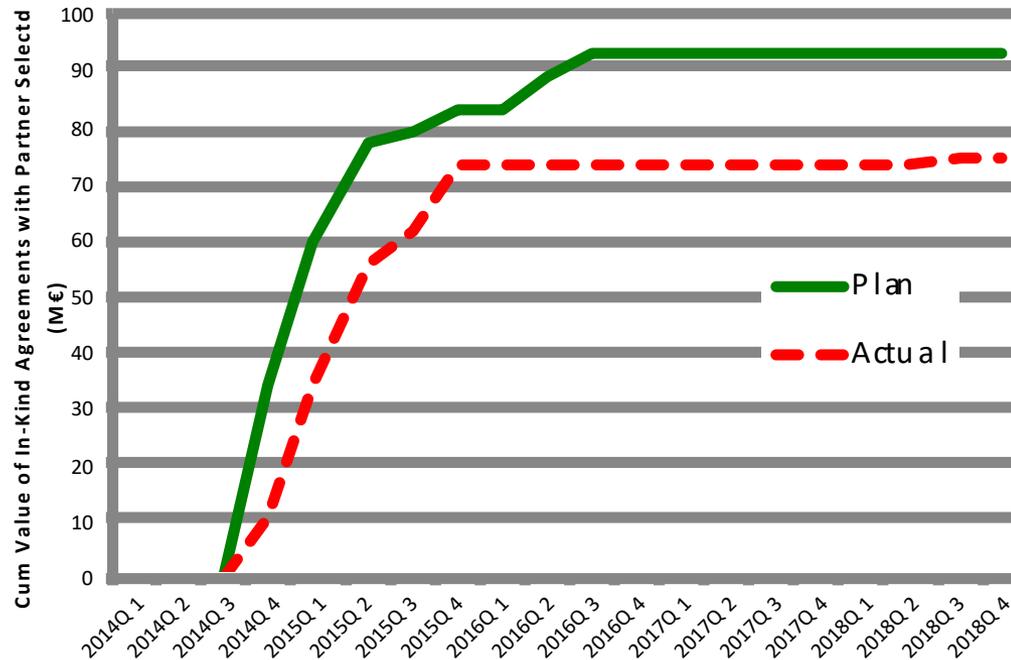
Formwork for Technical Galleries
outside Active Cells



ESS Target Station Collaborators



Target Project Overview



- The Target Project has partners selected for 16 IK packages constituting 80% of our originally planned IK scope
- Preliminary Design is 90% complete, Final Design is 48% complete
- 74M€ total Inkind (39% of Target Scope)

Status of Target Sub-Project In-Kind Packages

Target Sub-Project originally had 21 in-kind work elements

– TA or CA signed for 11 work elements

– Partner selected for another 5 work elements

– Completed

– Decision to self-perform 5 work elements

Work Package	In-Kind ID	In-Kind Contribution	Cost Book Value (M€)
2 Target Systems	TIK.2.1	Target Wheel	8,4
	TIK.2.2	Target He Cooling system	5,6
3 Moderator & Reflector	TIK.3.1	Moderator & Reflector Plugs	4,7
	TIK.3.2	Cryogenic Moderator System (LH2)	4,3
	TIK.3.3	Cryoplant	11,4
4 Monolith Systems	TIK.4.1	Target Monitoring Plug	0,7
	TIK.4.2	Proton Beam Instrumentation Plug	0,5
	TIK.4.3	Irradiation Module	0,3
	TIK.4.4	Proton Beam Window	0,9
	TIK.4.5	Monolith Vessel	4,6
	TIK.4.6	Neutron Beam Windows	0,5
	TIK.4.7	Monolith Atmosphere System	1,2
	TIK.4.8	Monolith Shielding Systems (incl. Port Blocks)	14,2
	TIK.4.9	Tuning Beam Dump	2,5
5 Fluid Systems	TIK.5.1	Primary Water Cooling Systems	2,5
	TIK.5.2	Intermediate Cooling Systems	2,6
	TIK.5.3	Ventilation & Confinement	7,6
6 Remote Handling	TIK.6.1	Active Cells	17,5
	TIK.6.2	Internal Casks and Handling Devices	3,6
	TIK.6.7	Remote Handling Support	1,0
8 Physics	TIK.8.1	Tungsten Release Factors	0,2

Budget

New approved budget:	189.7 M€
New Forecast:	32.5 M€
New Risk exposure:	41.2 M€
Schedule Variance: 0	(per definition)
Cost Variance: 0	(per definition)

Concluding remarks

Concluding Remarks

- Project is progressing well, forecast for RBOT is Q1 2022
- Target is in Final Design phase for most systems, and also ramping up into several major Procurements.
- Significant efforts have been spent on support for license application to the Swedish Radiation Safety Authority
- Target has entered installation phase, mainly for ACF, embedded and cast-in items, TSS and front end bldg.
- Five work elements identified as in-kind possibilities were released however no acceptable InKind partners found
- Target has completed looking for In-kind contributors
- Responses to TAC-17 recommendations can be found in separate presentation, uploaded to Indico.

Tomorrows Agenda

- t1) - Update on Target Station Accident Analyses
- t2) - Monolith inner (water-cooled) shielding
- t3) - Scheme for beam lines alignment
- t4) - Update on waste management
- t5) - Concerning interplay between Controls, MPS, TSS and
Control Room: a joint presentation