



# **Study & Readiness for the LS3 dismantling activities of WP8**

## **Transport and handling aspects**

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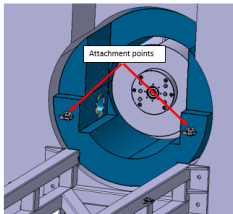
# WP8- dismantling activities planned for LS3

- Modification of the TAS and VAX @ ATLAS
- Modification of the TAS and VAX @ CMS
- Modification / relocation of the TAN @ IP 1-5 L/R
- TAN @ IP1 and 5 other concerns
- Some answers
- Some points we would have to pay attention
- Documentation
- Conclusion

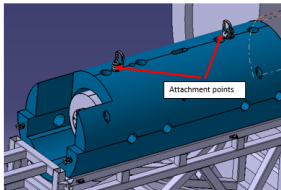
# Modification of the TAS and VAX @ ATLAS

## ■ Procedure for the removal of the TAS ready

- Attach the crane to the assembly points of the support frame
- Lift the frame to the monobloc
- Use 4 M16 screws to attach it to the monobloc, the rails of the frame should be lower than the rails of the monobloc to prevent the tas cradle from getting stuck

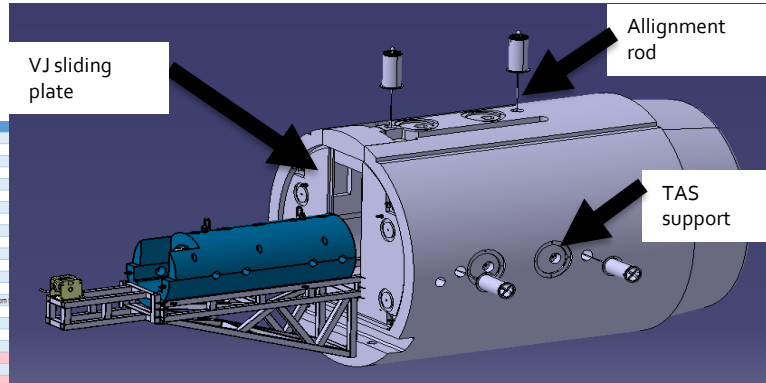


- Attach the Rud VRS-F-M20 attachment points to the tas cradle
- Attach the winch cable to the assembly points
- Pull the tas cradle out using the winch
- Remove the front attachment points
- Install the front blocking bar



- Install the Rud ICE-LBG-SR 6.7 x M30 on top of the TAS cradle

No	Job	Tools	Parts	Procedure
1	Upper alignment spacer removal	SW5 allen key	-	Remove the 4 M8 screws
2	Remove the upper half of the alignment rod	-	-	-
3	Remove the alignment spacer	SW13	-	Remove the 8 M8 screws
4	Removal of upper surrounding shield	4 assembly points + crane	-	-
5	Removal of lower surrounding shield	hydraulic spinners	-	-
6	TCSP shielding plug removal	-	-	-
7	Removal of VT and VI beam pipe sections	-	-	-
8	Assembly of the VI sliding plane Attachment points	SW12 allen key	2x Spander VRS-F-M20	hand-tight
9	Loosen the M20 nuts on all 4 interface plates	SW30	-	Loosen them about 20mm
10	Tight the M20 screws (HVC11, 2041) screws on all 4 interface plates	SW30	-	Tight them about 20mm to remove the interface plates
11	Remove the M20 screws on all 4 interface plates	SW18	-	-
12	Remove the 4 interface plates	-	-	-
13	Attach the crane to the VI sliding plane attachment points	crane	Round sling set (30mm; WLL 3t)	-
14	Tighten the crane cable	crane	-	The crane should be in a position in which it could fix the VI sliding plate
15	Remove the four M20 screws which connect the VI sliding plate to the monobloc	SW30	-	First the two at the bottom, then the two on top; crane has to be adjusted to prevent the VI sliding plate from
16	Remove the VI sliding plate with the crane	crane	-	-
17	Store the VI sliding plate	-	-	-
18	Disconnecting the heating and cooling equipment at the back of the TAS	-	-	-
19	Installing a blocking bar on the back side of the TAS	-	-	-
20	Lift the TAS	SW38	-	Turn the two shafts on the top in the anticlockwise direction (preferably simultaneous)
21	Installing the support between the TAS and the TAS cradle	rods	TAS support	-
22	Installing the square bars between the TAS cradle and the monobloc	rubber hammer	Square bars	-
23	Removal of the support rod	SW38 + 7/8"	-	Set removal of the horizontal ones then the vertical ones; SW 38 needed for the Hex Shaft; SW 7/8" for the HDI nut
24	Remove the lower half of the alignment rod	-	-	Loosen the rod like a screw
25	Attach the hooks to the assembly points of the support frame	-	-	Important to put the hooks in the right position to align the frame to the monobloc
26	Lift the support frame next to the monobloc	crane	-	-
27	Assembly of the support frame	SW65	4x ISO 4027 M16x100 x 8	Mount the frame a little bit lower than the support rods
28	Assembly of the front attachment points	SW12 allen key	2x Spander VRS-F-M20	hand-tight
29	Attaching the hooks to the assembly point	-	Round sling set (30mm; WLL 3t)	-
30	Emptying the TAS cradle	-	-	approx 325 which turns are needed; pull TAS cradle until it touches the fence
31	Remove the front attachment points	SW12 allen key	-	-
32	Installing a blocking bar on the front side of the TAS	blocking bar	-	-
33	Assembly of the top Attachment points	SW46	2x Rud ICE-LBG-SR 6.7 x M30	hand-tight
34	Attaching the hooks to the assembly point	-	Round sling set (30mm; WLL 3t)	Attach it without skew
35	Lift the TAS cradle to the surface	S/R surface crane	-	-
36	Lift the TAS cradle into a container at the surface	-	container; supports	-
37	Remove the sling set from the TAS cradle	-	-	-
38	Transport the container	-	-	-
39	Install additional shielding for the operators	-	shielding	-
40	Align the support frame to the sarcophagus	-	sarcophagus; support frame	-
41	Attaching the hooks to the assembly points	-	-	-
42	Attach crane to the suspension link	crane	Round sling set (30mm; WLL 6t)	-
43	Lift the TAS outside the container	crane	-	-
44	Place the TAS on a support frame	crane	-	-
45	Remove the sling set from the TAS cradle	-	-	-
46	Put the TAS in the sarcophagus	winch	-	-
47	Close the sarcophagus	-	-	-
48	Detach the winch	-	-	-
49	Transport the sarcophagus	-	-	-

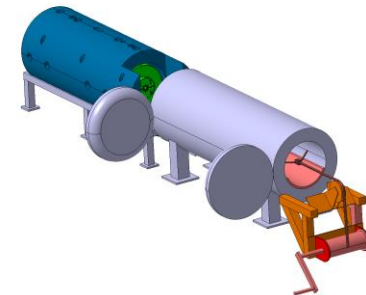


Include:

- Work steps
- Number of workers
- Location
- Time for intervention: a couple of day / side
- Already shown to ATLAS team
- Status of ATLAS included in the study

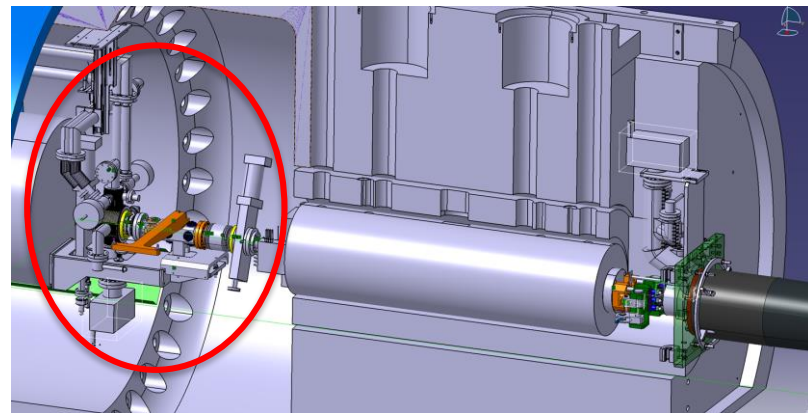
# Modification of the TAS and VAX @ ATLAS

- What is missing
  - The dose rate estimation for the finalization of the WDP
  - The construction of the tooling (4-6 months required)
  - The procurement of some lifting accessories (3-4 months required)
  - Requirement in term on transport and storage cask ?



# Modification of the TAS and VAX @ ATLAS

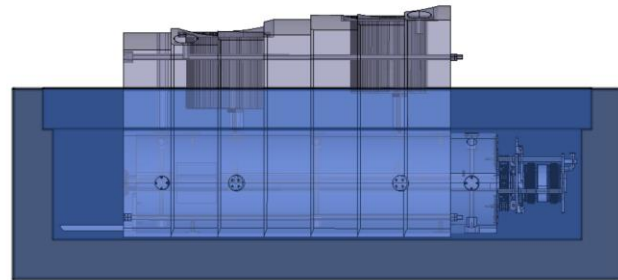
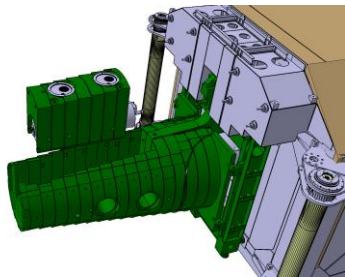
- VAX removal
  - Simple operation done via the tunnel
  - Several objects with a weight of a couple of kg
  - Activity in the background of the Inner Triplets magnets removal
  - WDP to built
  - Handling required for which step ?



# Modification of the TAS and VAX @ CMS

- No specific tooling required for the removal of the TAS (everything goes out with the overhead crane)
- Work procedure described (reverse procedure as for installation)
- Requirement in term on transport and storage cask ?

Detail study done by CMS



# Modification of the TAS and VAX @ CMS

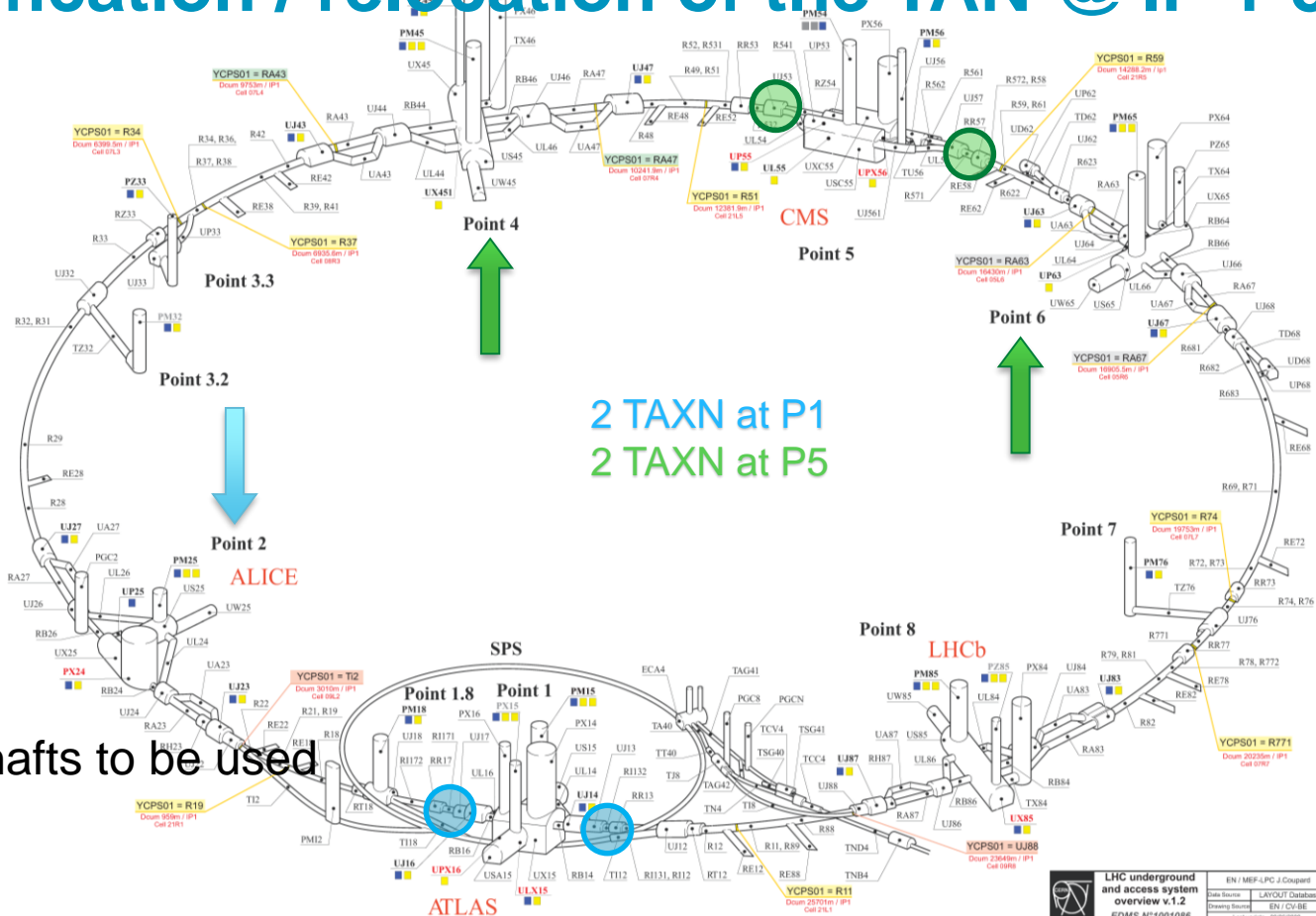
- VAX removal
  - Simple operation done via the tunnel
  - Object weight a couple of kg
  - Activity in the background of the Inner Triplets magnets removal
  - WDP to be built
  - Handling required for which step ?

# Modification / relocation of the TAN @ IP 1-5 L/R

- A work procedure has been defined
- Scenario in consideration -> TAN's transported to a surface workshop for modification
- WDP to be planned
- 2 days activity / TAN



# Modification / relocation of the TAN @ IP 1-5 L/R

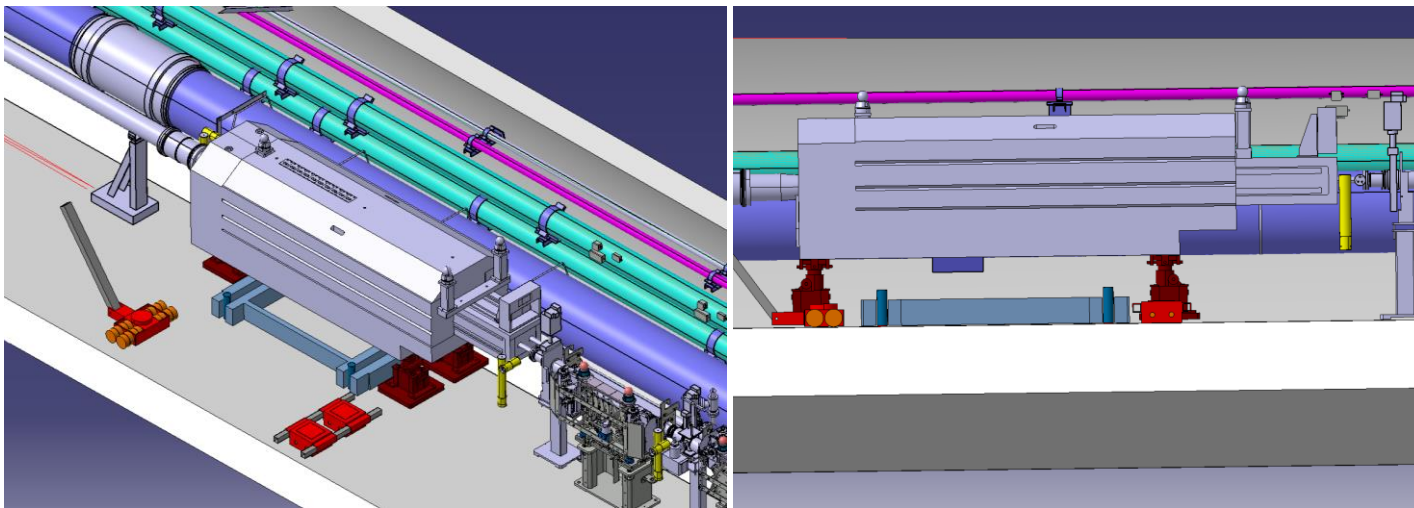


2 TAXN at P1  
2 TAXN at P5

Possible Shafts to be used

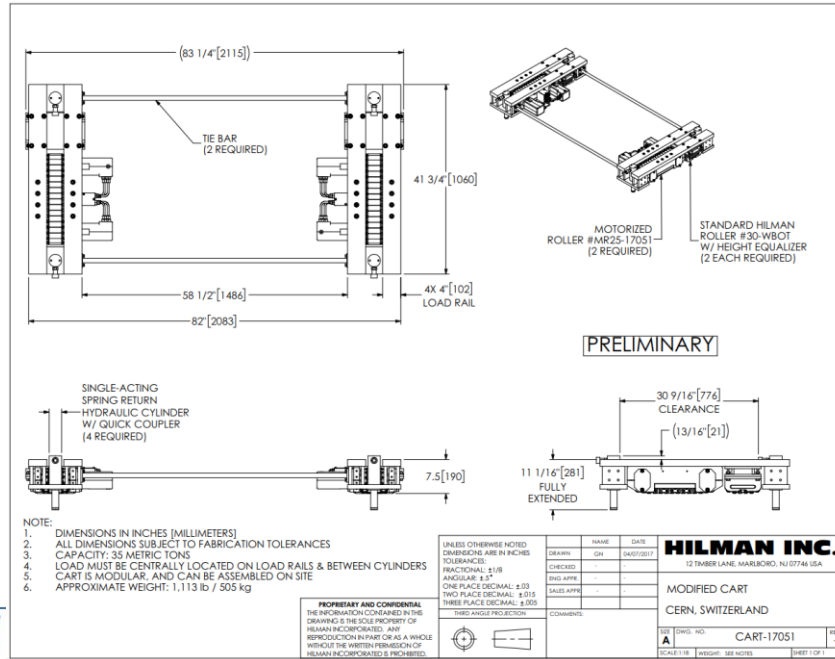
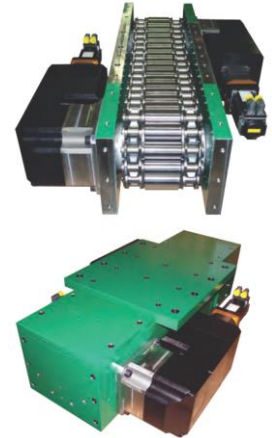
# Modification / relocation of the TAN @ IP 1-5 L/R

- Conceptual design of the removal sequence



# Modification / relocation of the TAN @ IP 1-5 L/R

- JUNG dollies to act as a trailer to carry the TAN and TAXN ~3km
- Lateral displacement mechanism proposed by HILLMAN with actuated rollers.



- Additional studies need to be carried out  
 - 6-8 month delivery time

# TAN @ IP1 and 5 other concerns

- Forward Detectors desintallation (re-installation not foreseen for the moment.... only the BRAN remains) not to forget in the planning(1 day /TAN)
- Not clear on what to do with the TAN mini cranes at IP1 and the TAN CMS handling system
- Removal of those devices -> reverse procedure as for the installation ~3 days per side (CMS system to be removed before the TAN, ATLAS System to be removed after the TAN)
- Transport on the public roads might require special arrangement (additional time to foresee)



# Documentation

- Draft procedure for the dismantling of the TAS at ATLAS:  
[https://indico.cern.ch/event/561232/contributions/2266720/attachments/1325539/1989695/TAS\\_removal\\_study\\_mofication.pptx](https://indico.cern.ch/event/561232/contributions/2266720/attachments/1325539/1989695/TAS_removal_study_mofication.pptx)
- Draft procedure for the dismantling of the TAS at CMS:  
[https://indico.cern.ch/event/647382/contributions/2630663/attachments/1479507/2293645/INDC\\_WP8\\_pres\\_2\\_20170620.pdf](https://indico.cern.ch/event/647382/contributions/2630663/attachments/1479507/2293645/INDC_WP8_pres_2_20170620.pdf)
- Draft procedure for the dismantling of the TAN:  
<https://edms.cern.ch/document/1583668/1>
- Many other docs presented during the bi-weekly meeting of the WP8  
<https://indico.cern.ch/category/5646/>

# Some answers

- **A)** Is the global time for removal (in the sequencing file) correct? **No take in consideration the figures shown in this presentation (time and missing equipments)**
- **B)** Is the order (TAN and then TAS) correct/preferred? **No see next point**
- **C)** Can removal be done in parallel on several points or the 8 objects have to be removed one after the other? (RESOURCES) **No**
- **ATLAS and CMS TAS independent and different tooling but one per experiment at same time**
- **TAN (IP 1 and 5) one by one; same equipment and resources for this handling operation**
- **D)** Can be preferable to do TAN IRxR and after TAS IRxR, then go for TAN IRxL and after TAS IRxL, or first take out all the TANs and then all the TAS, or something else? **See the answer of the previous question**
- **E)** Any news/constraint regarding the experimental areas scheduling? **The TAS removal has to be done according the experiment schedule**

# Some points we would have to pay attention

- Waste: Where all this will stored? ISR?
- Transport: We have to respect the transport rules (ADR)
- Storage: we need to have a place on the surface building for a temporary storage for a couple of days

# Conclusion

- We have slowdown the studies for all those activities focusing our resources in the LS2 activities
- A lot of details need to be finished (coordination with other groups, ATLAS and CMS)
- Some coordination to be done between the different parties
- We are on time for all those activities
- We would have to look for the optimization of the work procedure to reduce doses (ALARA)
- We have the required resources to continue the work

We are far from LS3 a lot of things could easily change!!





***Questions?***

