Studies on the shielding wall reconfiguration between PS et PSB

F. Delsaux, C. Bertone EN-HE-PO

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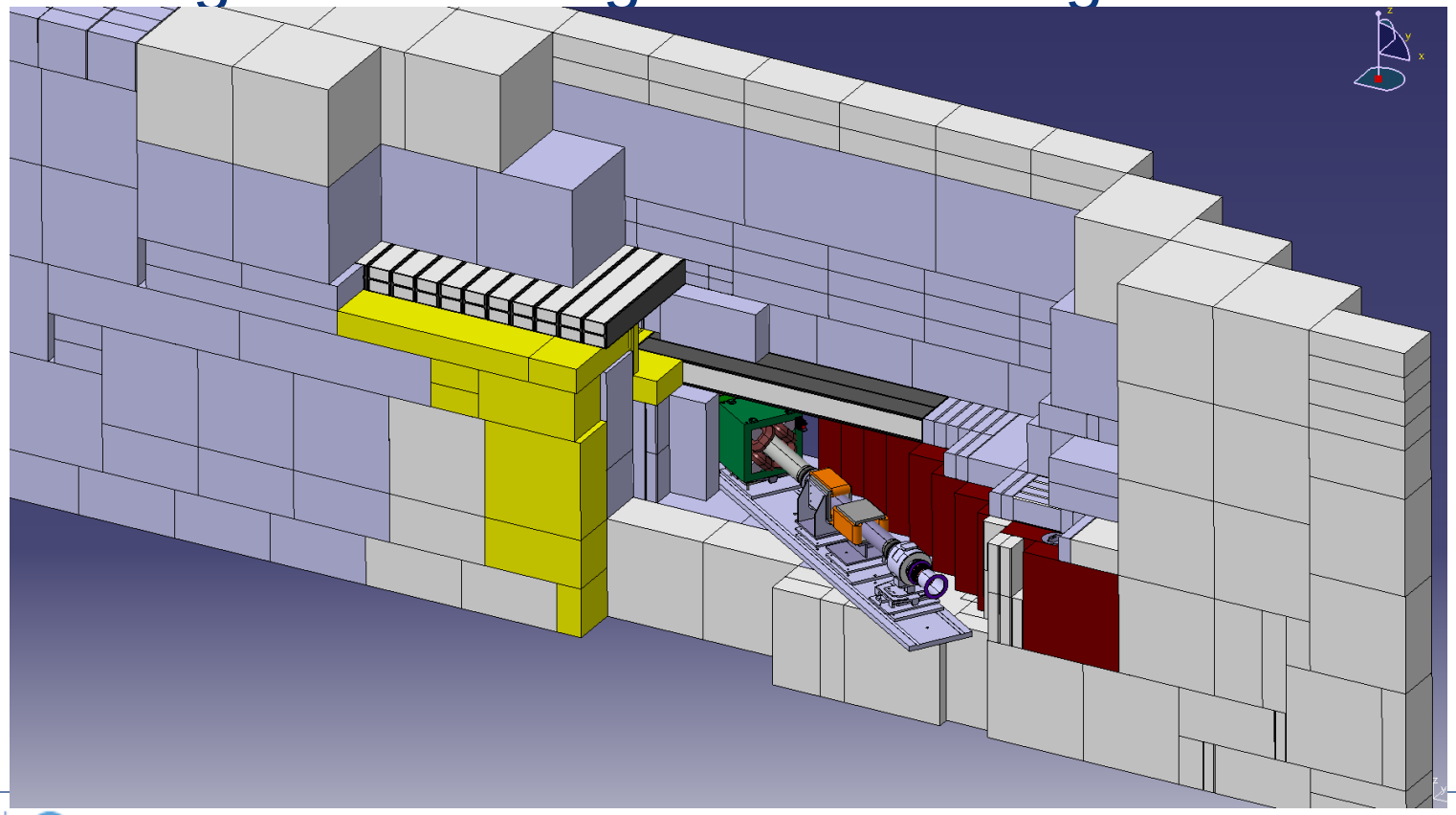
EDMS 1973480

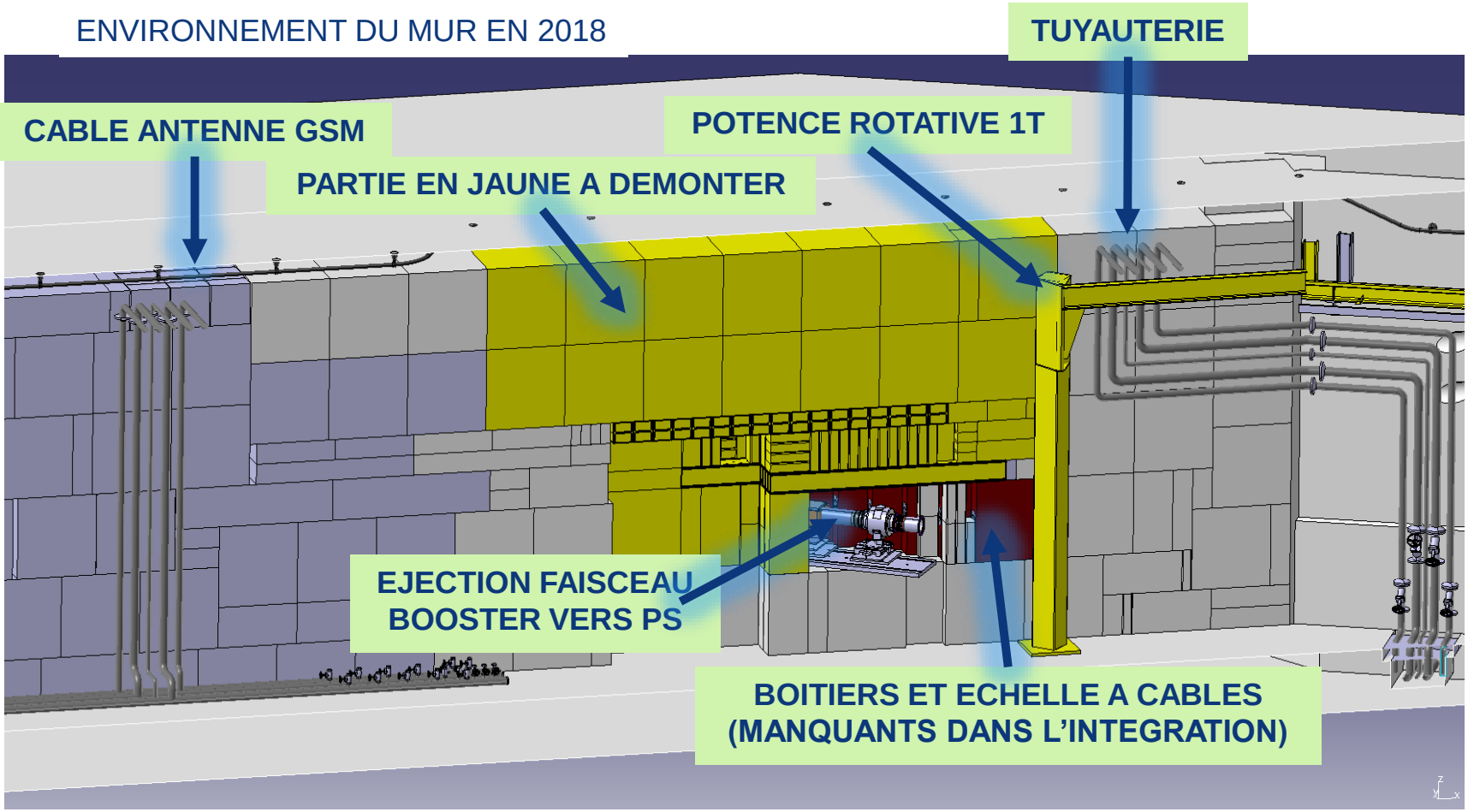
CERN | EN ENGINEERING DEPARTMENT

‘Reasonable’ wall dismantling

- Allowing to access to all components on the sliding table for removal and installation
- Allowing the exchange of the sliding table

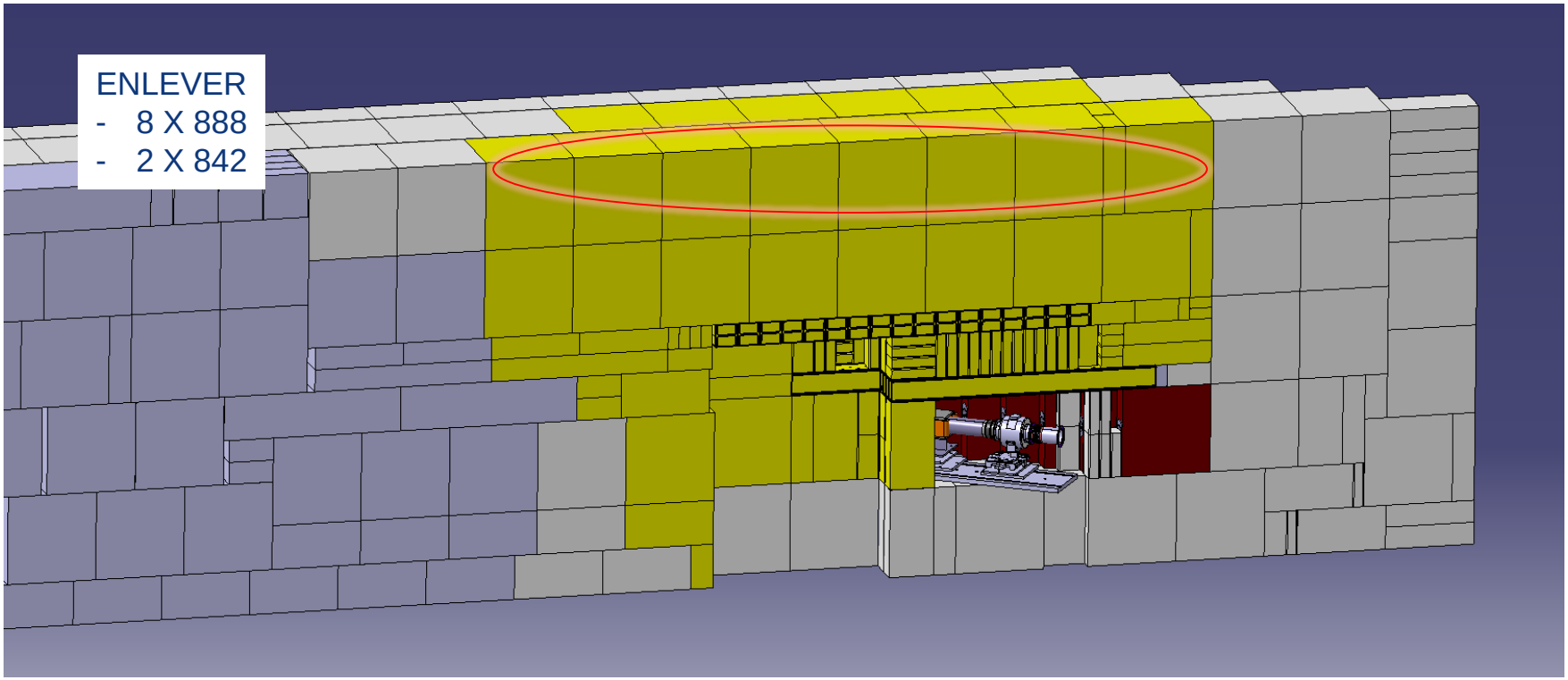


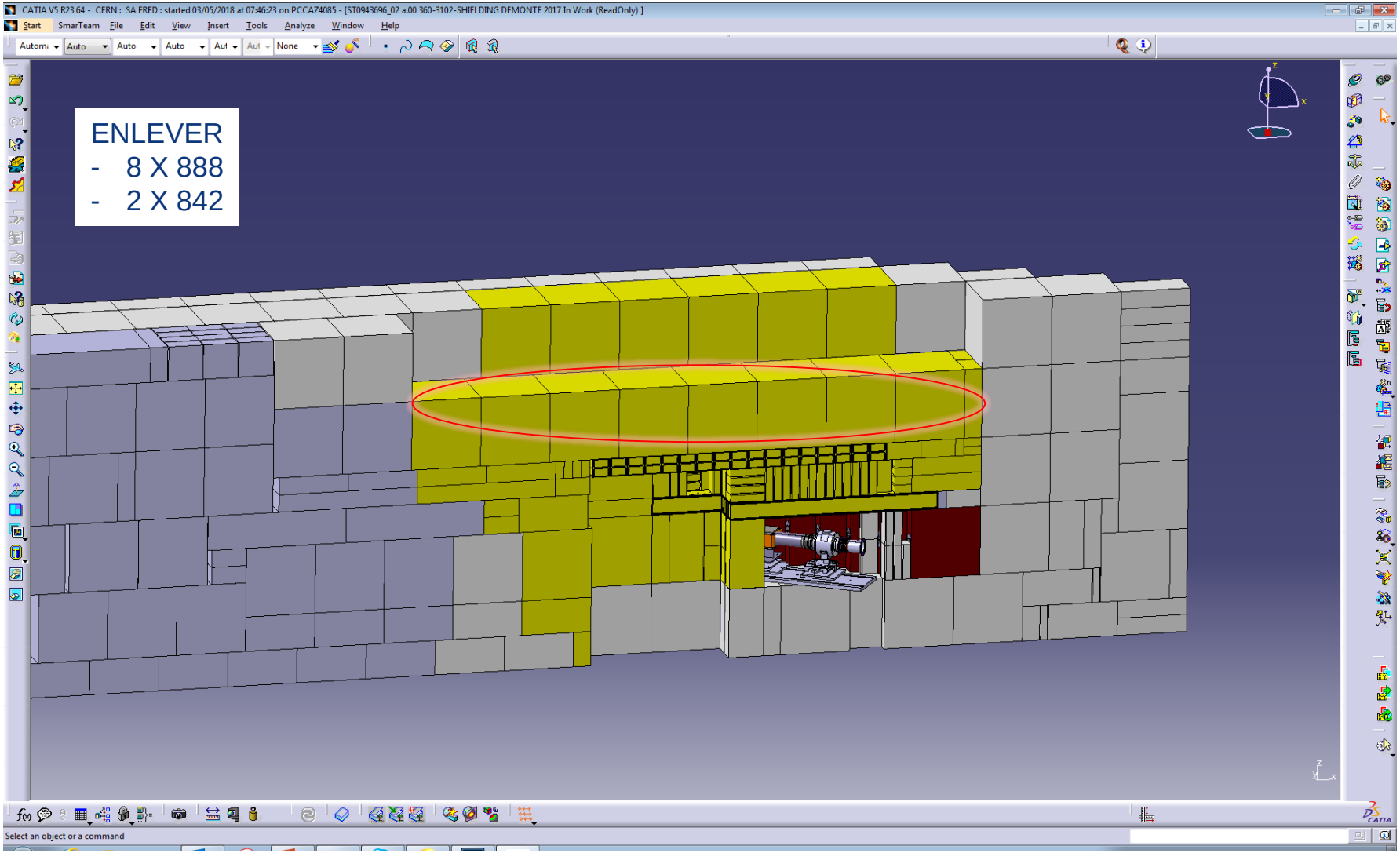
3D of wall face (2018)



Services to be dismantled to remove the wall

MUR COMPLET EN 2017

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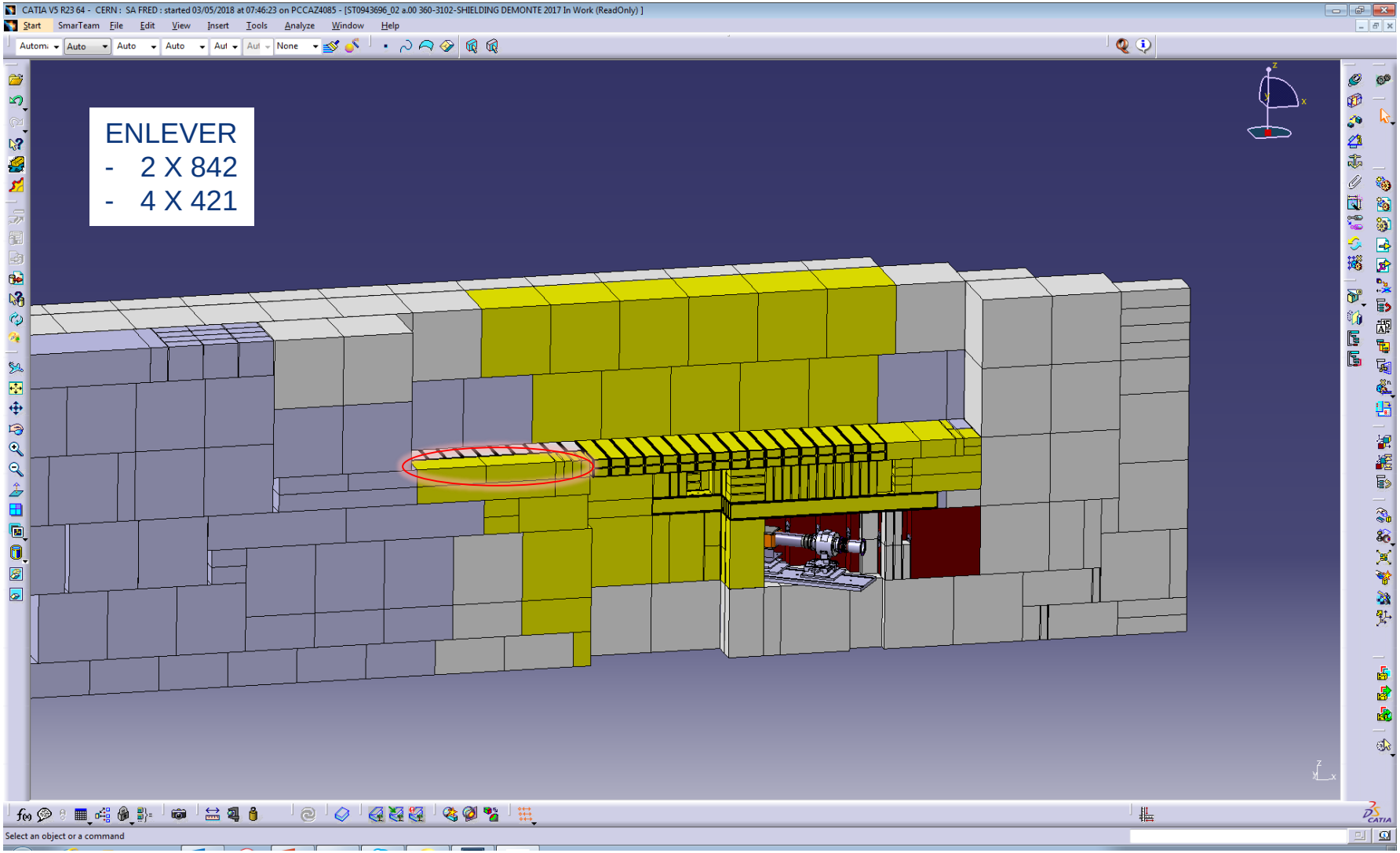
ENLEVER
- 8 X 888
- 2 X 842
Select an object or a command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ENLEVER
- 2 X 842
- 4 X 421
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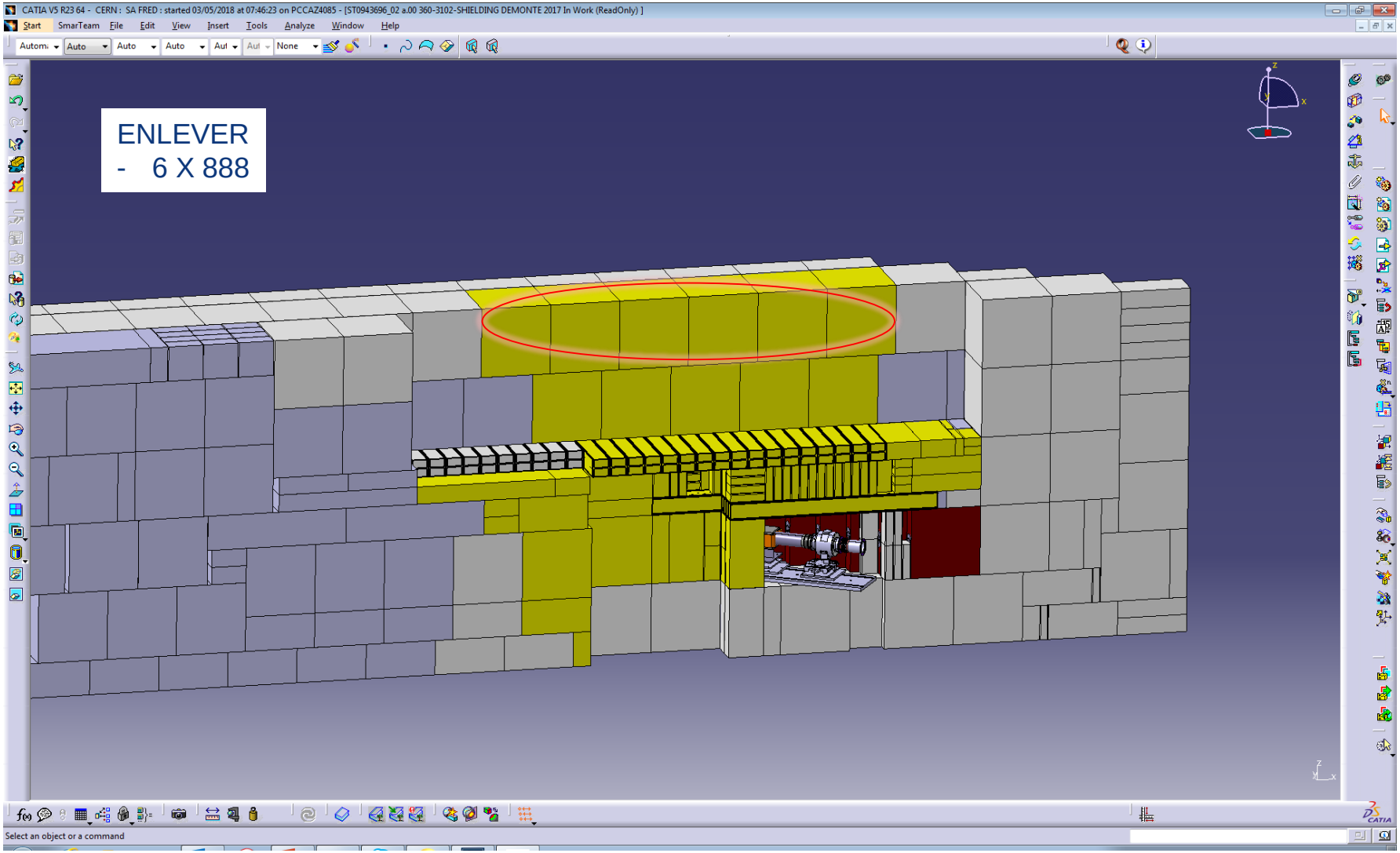
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- 6 X 888
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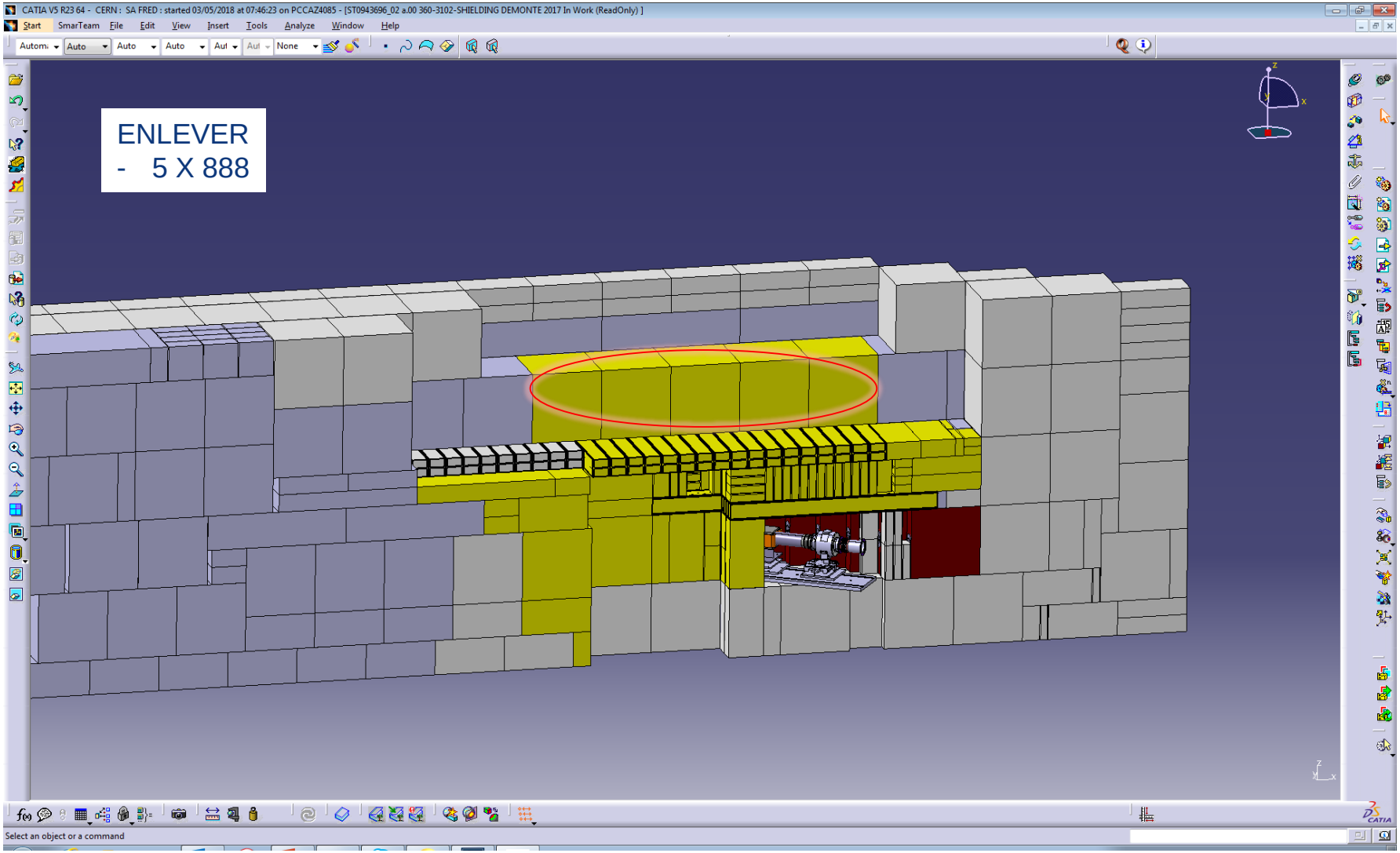
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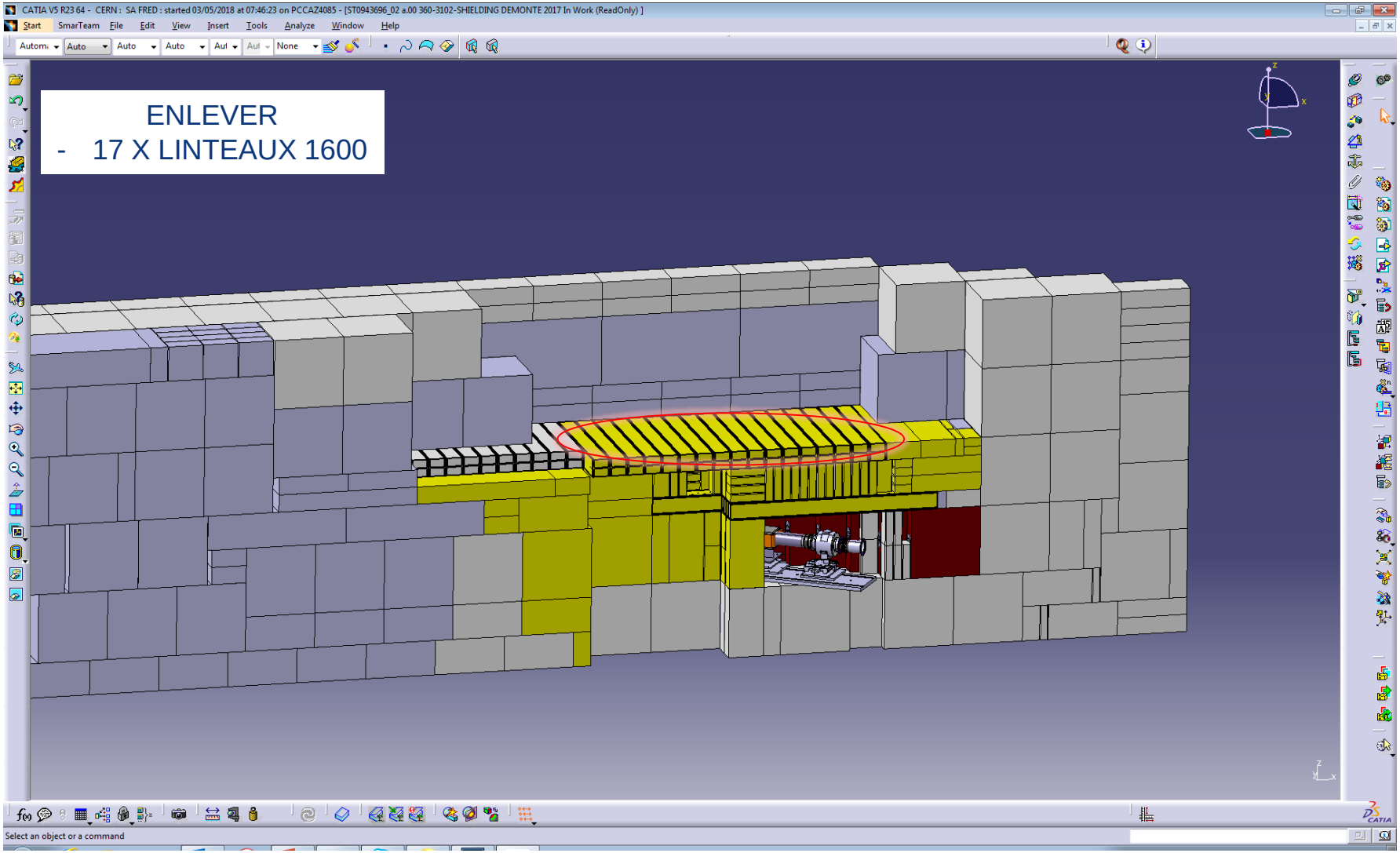
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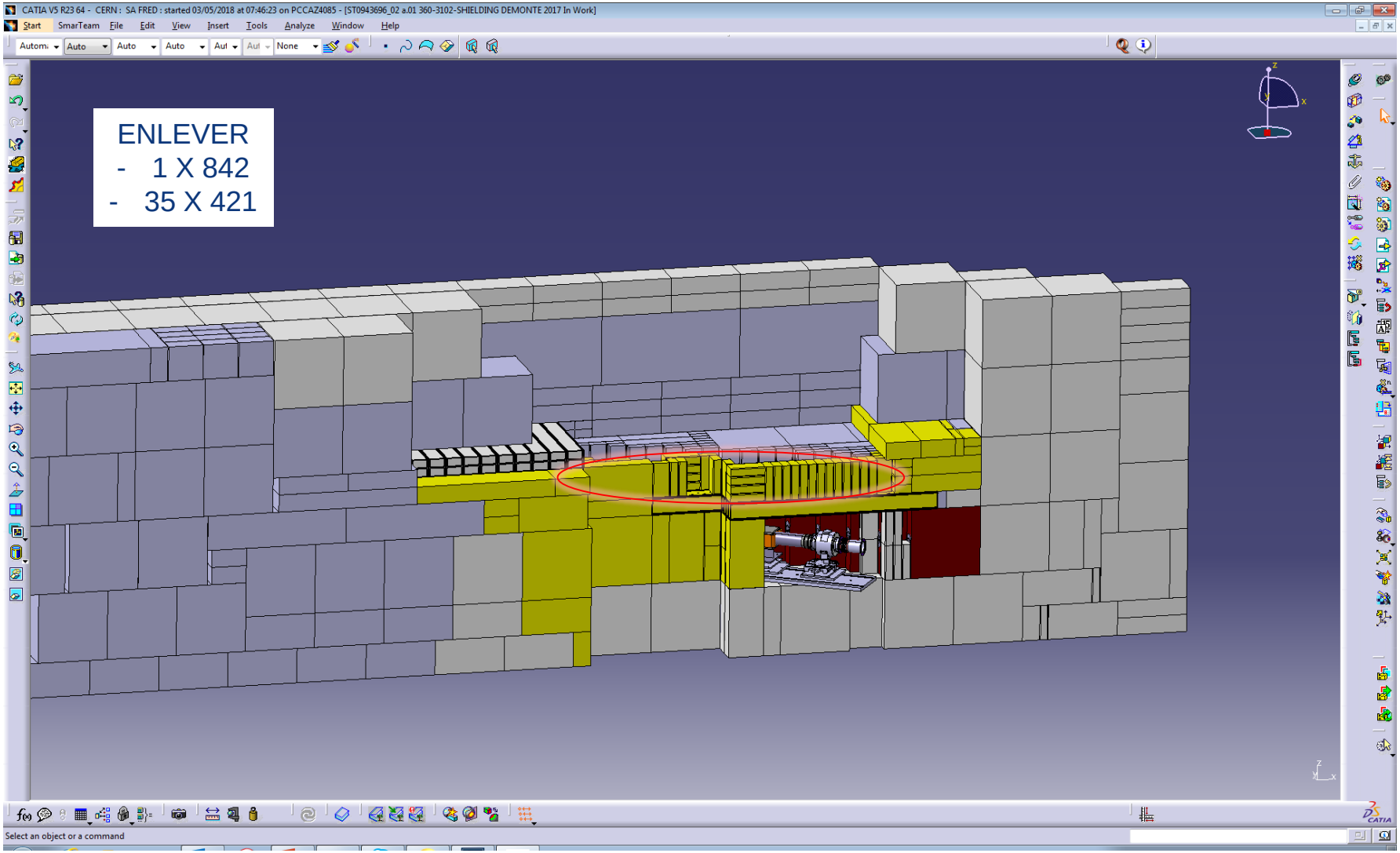
- 17 X LINTEAUX 1600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- 35 X 421
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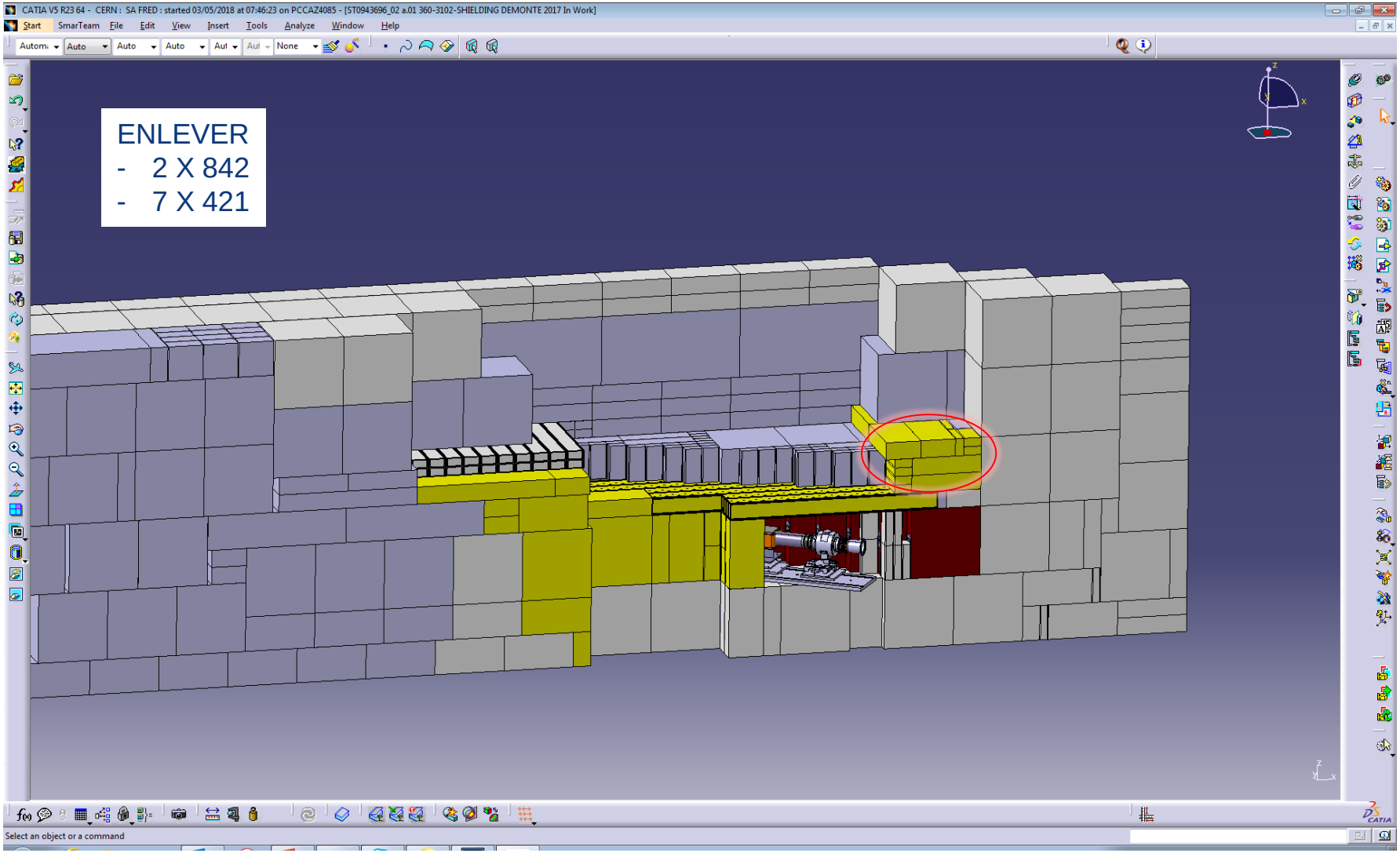
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- 7 X 421
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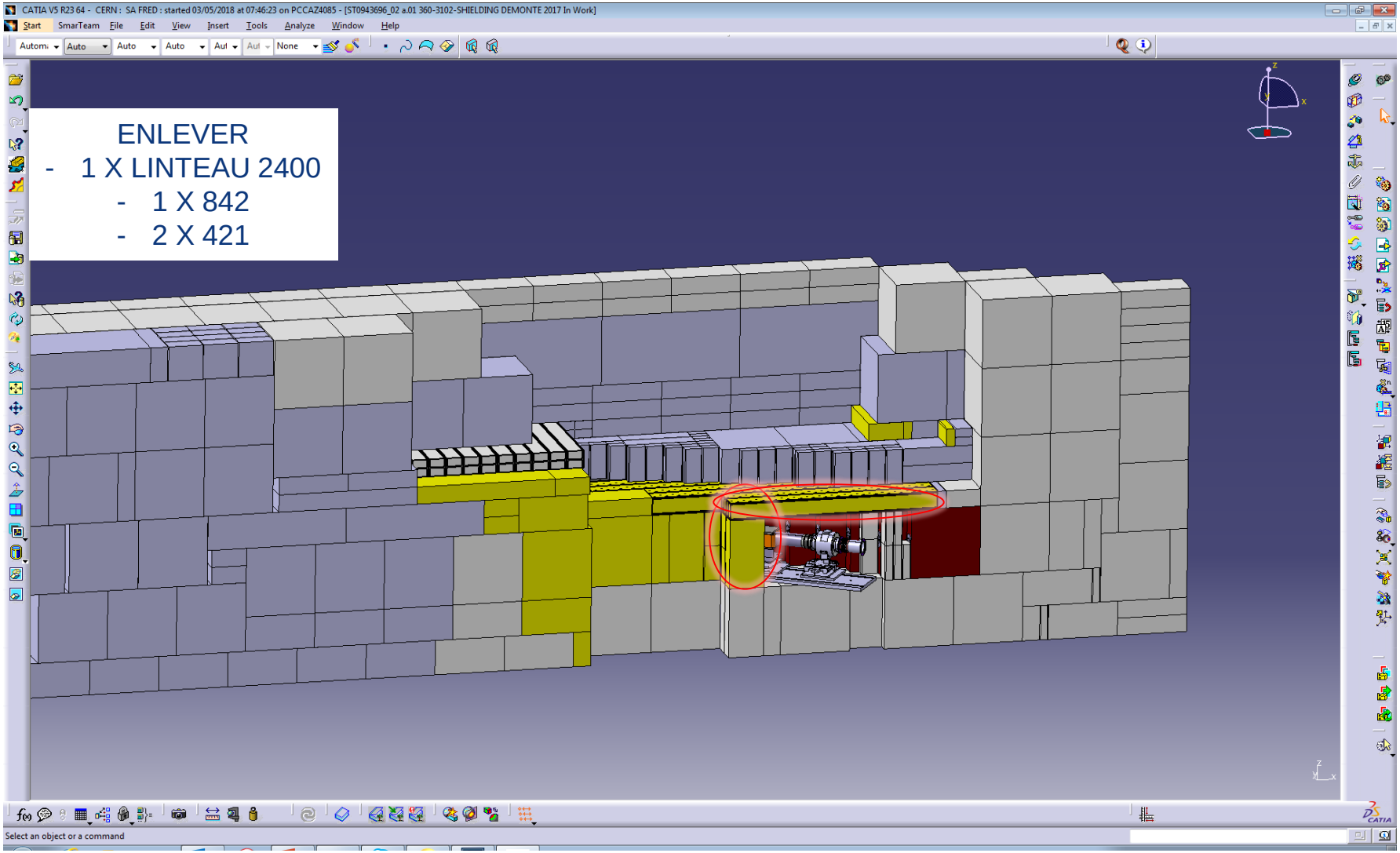
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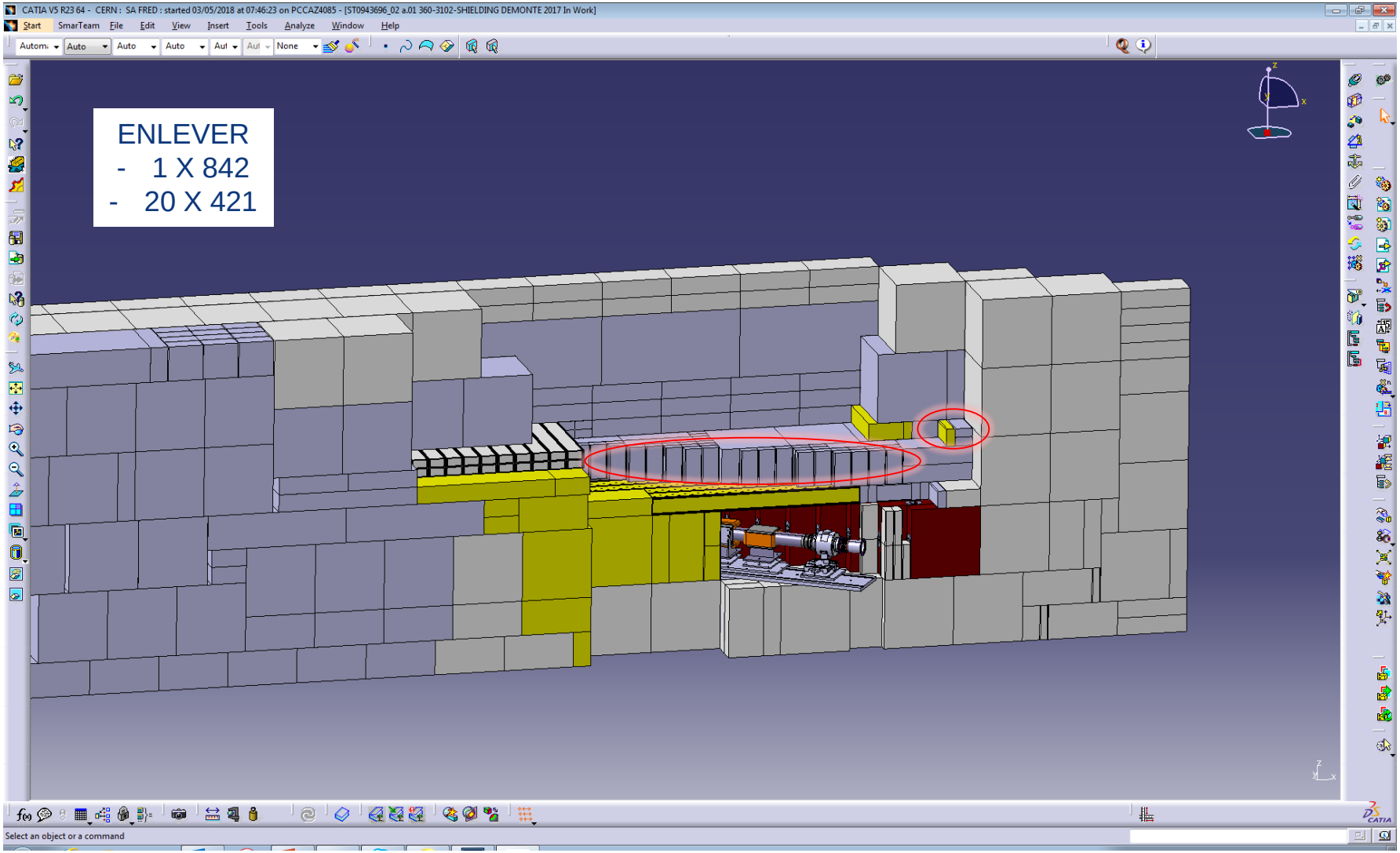
- 1 X LINTEAU 2400
- 1 X 842
- 2 X 421
Select an object or a command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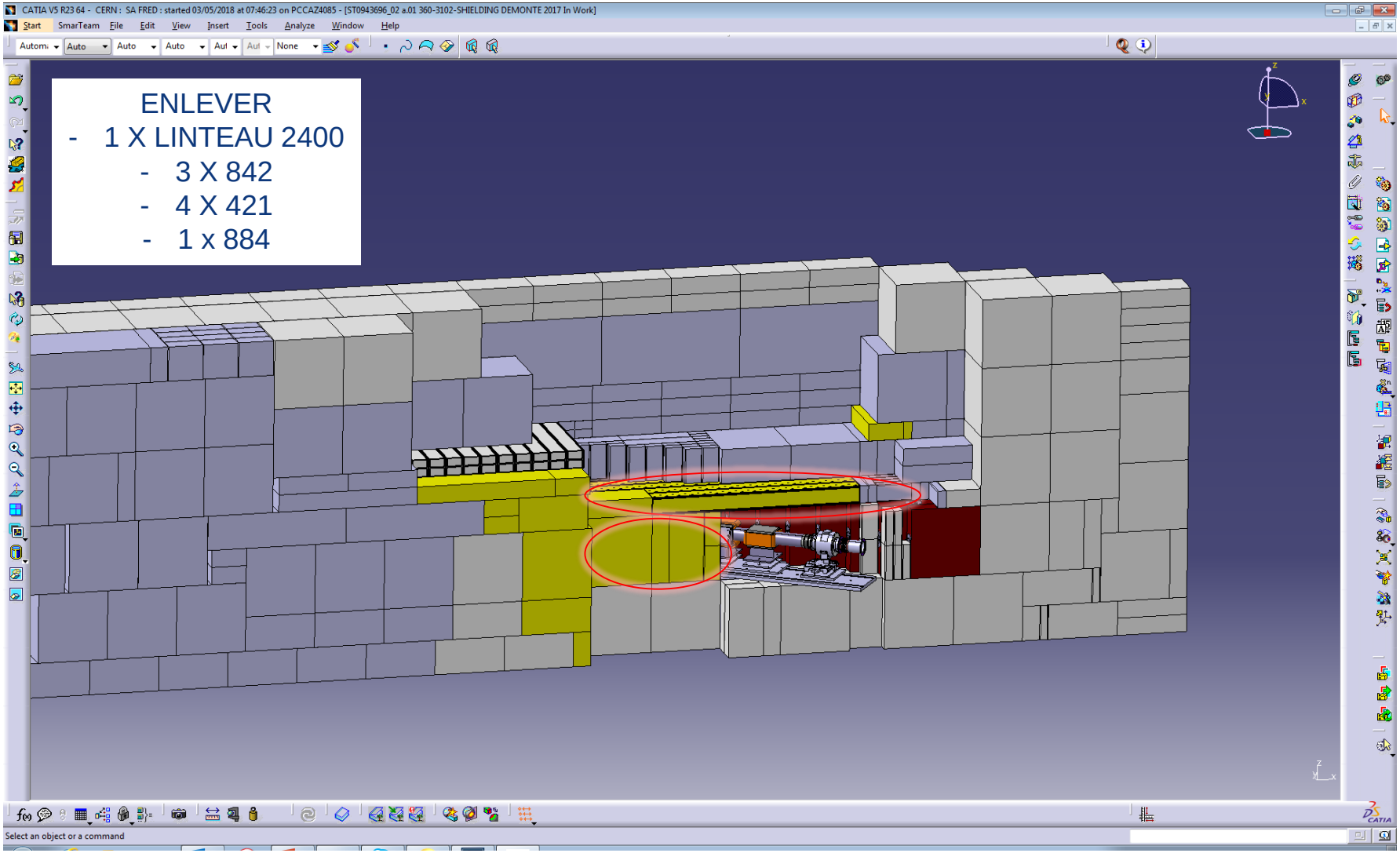
- 20 X 421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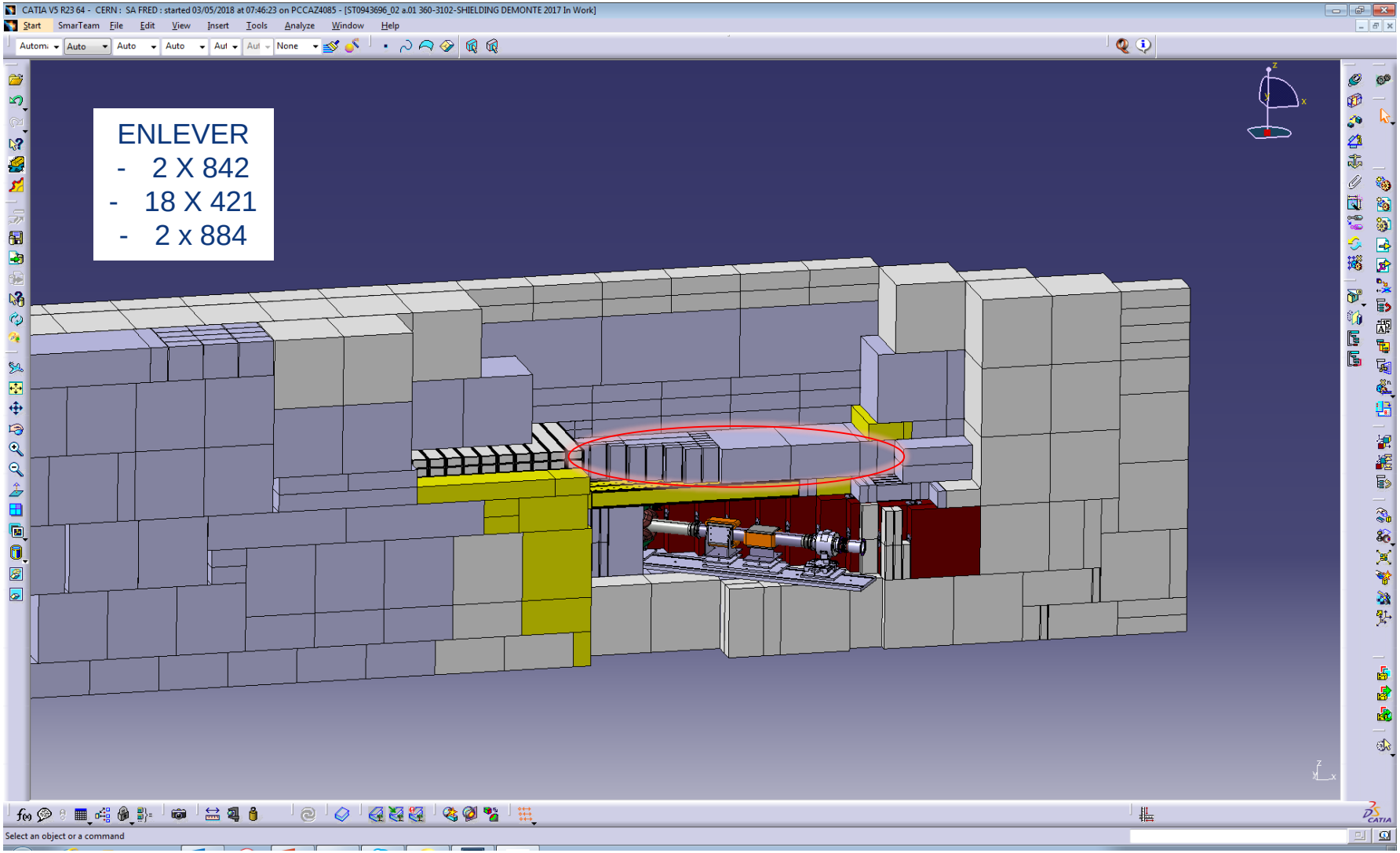
- 1 X LINTEAU 2400
- 3 X 842
- 4 X 421
- 1 x 884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ENLEVER
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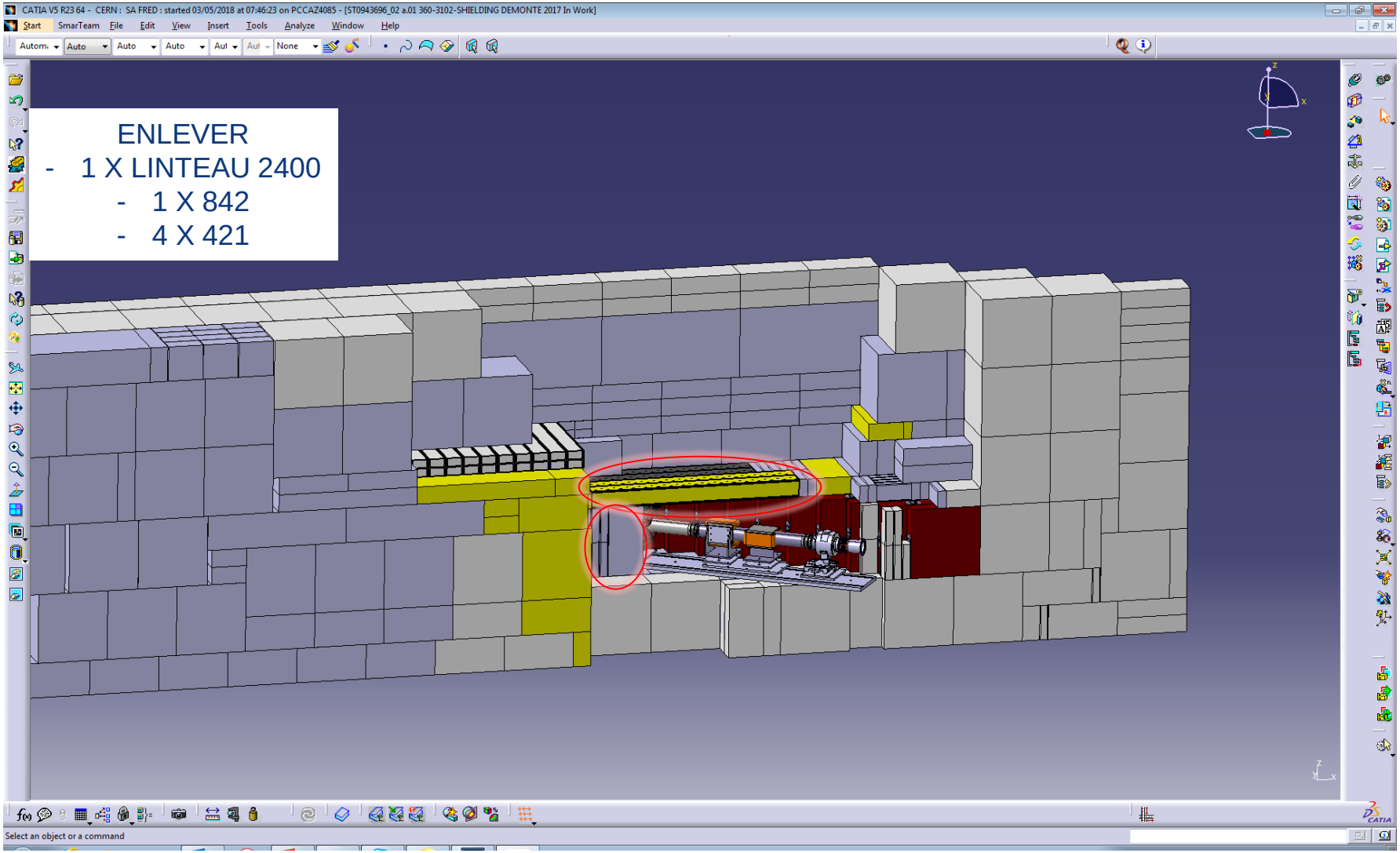
- 18 X 421
- 2 x 884
Select an object or a command


ENLEVER
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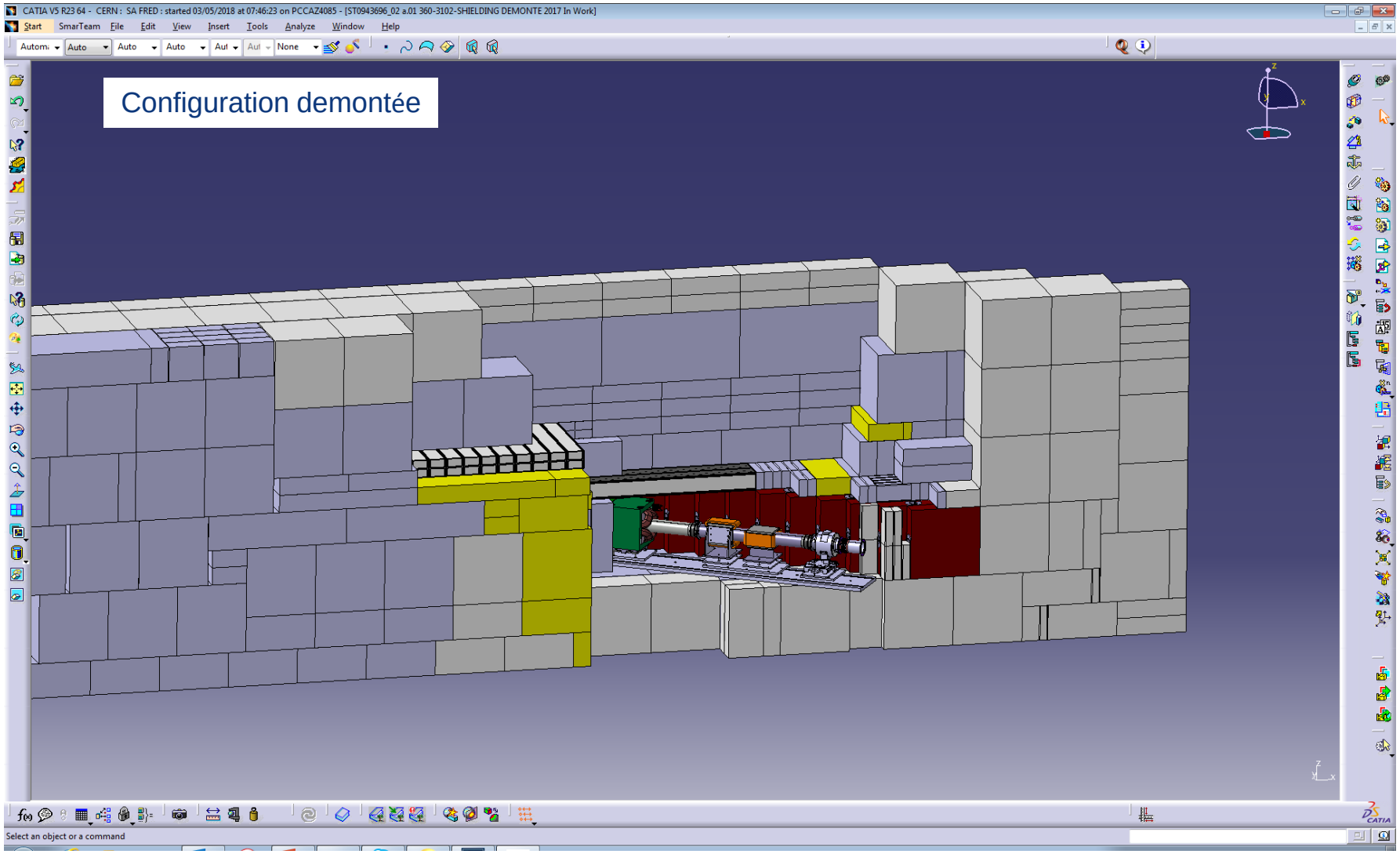
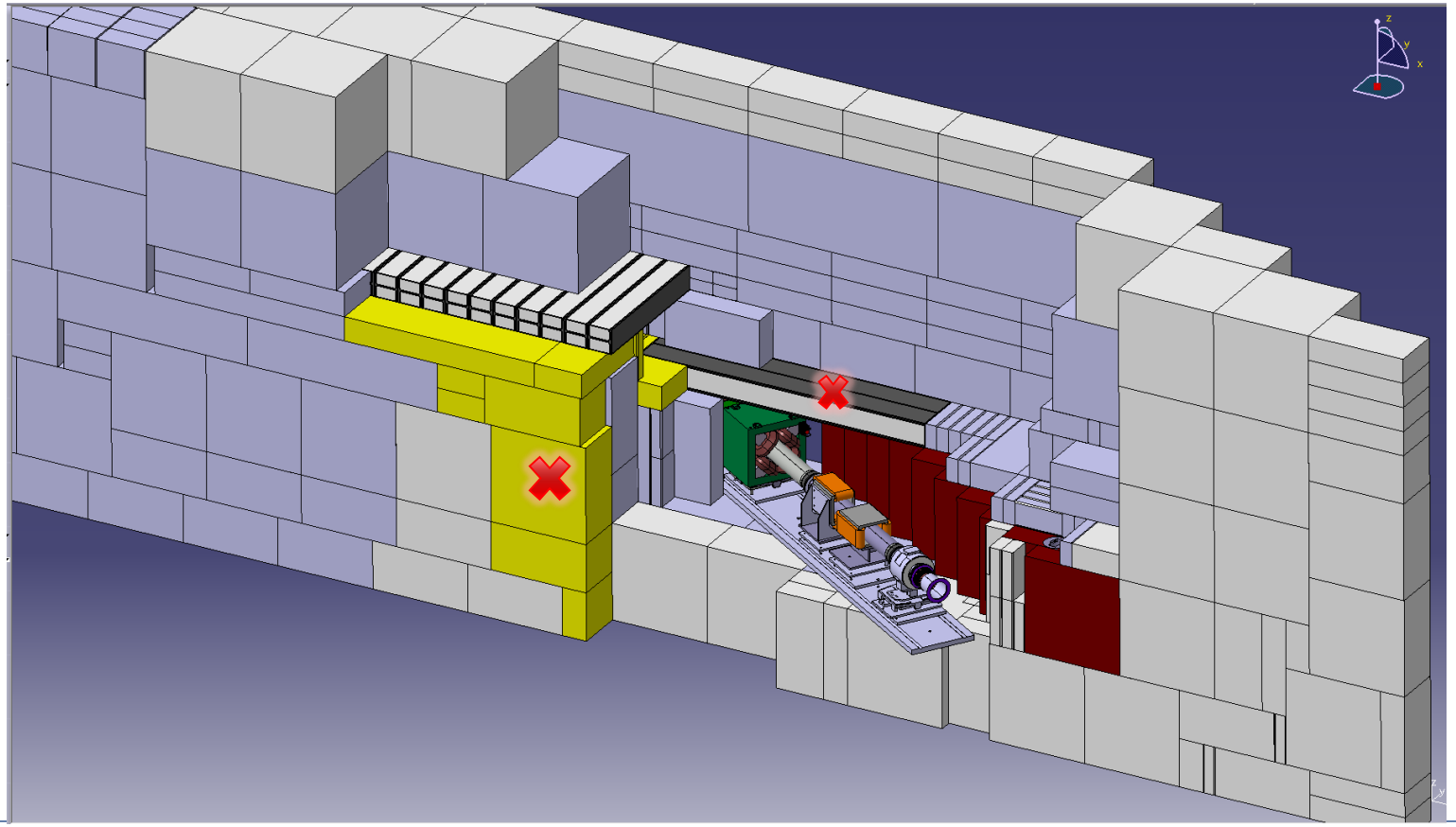
- 1 X 842
- 4 X 421

Configuration demontée



Further wall dismantling

La dépose ultérieure avoir l'accès total par le haut et en particulier du linteau ou du block ci-dessous impliquent le démontage du mur sur toute son épaisseur.
Pour accéder aux blocks arrière avec nos engins, nous sommes obligés à déposer la base, ce qui implique une partie du mur à enlever beaucoup trop importante.



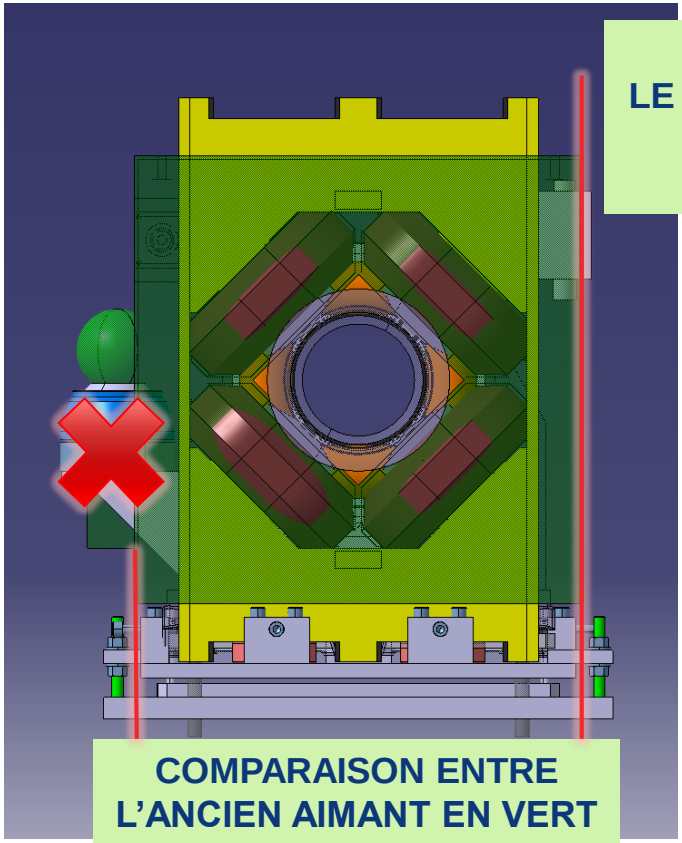
RECAPITULATIF DE LA PARTIE DU BLINDAGE A DEMONTER (AU MINIMUM) :

888 (1250 Kg)= 27
884 (630 Kg) = 3
842 (160 Kg) = 17
421 (20 Kg) = 94
LINTEAU 2400 mm (653 Kg) = 3
LINTEAU 1600 mm (120 Kg) = 3

TOTAL : ENVIRON 18 M3 POUR 44 TONNES

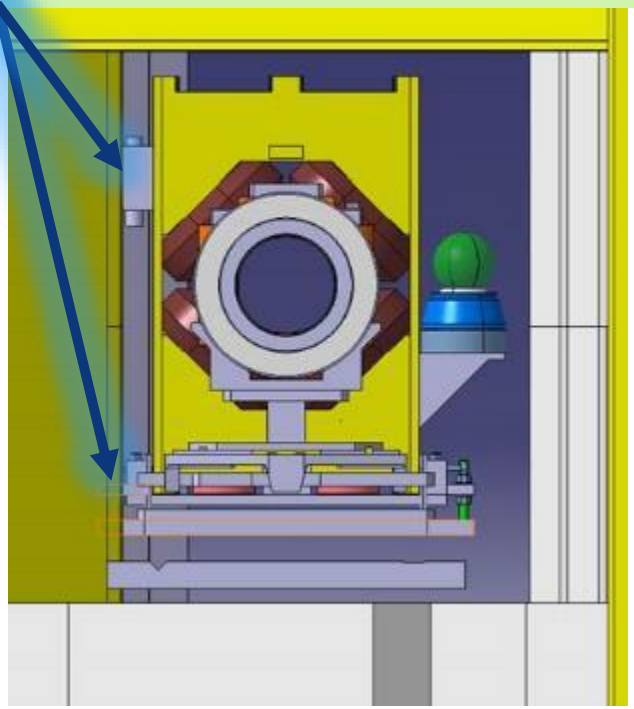
Comparison between magnets

La largeur de l'aimant a insérer pose problème mais pas la hauteur selon nos études. Pour s'assurer de pouvoir insérer l'aimant jaune sans modification du blindage, il serait bien de supprimer toutes les pièces dépassant de l'enveloppe vert



COMPARAISON ENTRE L'ANCIEN AIMANT EN VERT ET LE NOUVEAU EN JAUNE (VUE COTE PS)

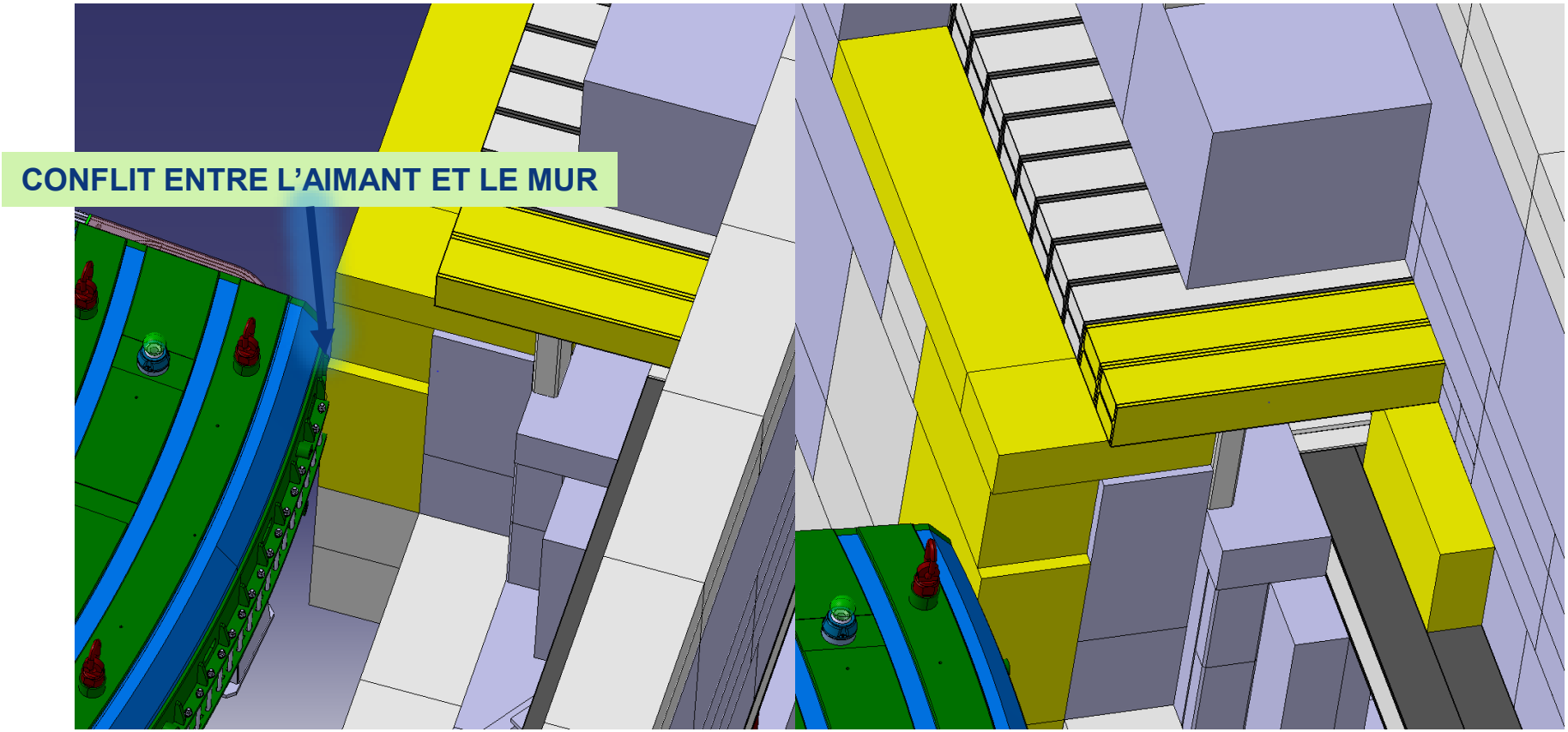
THEORIQUEMENT IL EXISTE UN CONFLIT ENTRE LE PETIT COFFRET DU NOUVEL AIMANT ET LE MUR ACTUEL AINSI QU'ENTRE LE SUPPORT ET CE MEME MUR (VUE COTE BOOSTER)



Interferences

- Interferences have been found between the wall as such and the LIU extraction line
  - Bending magnet (PSB) with wall
  - Beam stopper support with support plate of the magnets embedded into the wall (PSB)
  - Injection line and wall on PS side

Bending magnet and shielding wall

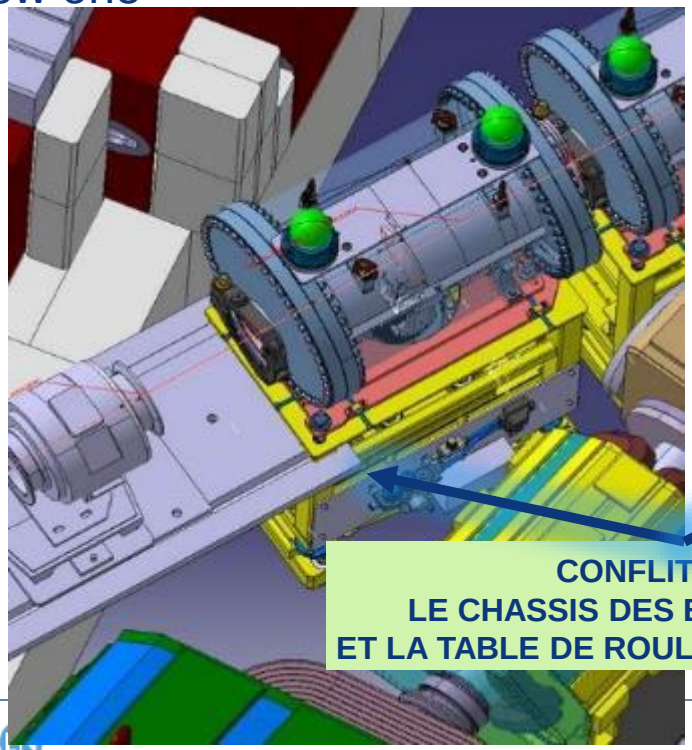


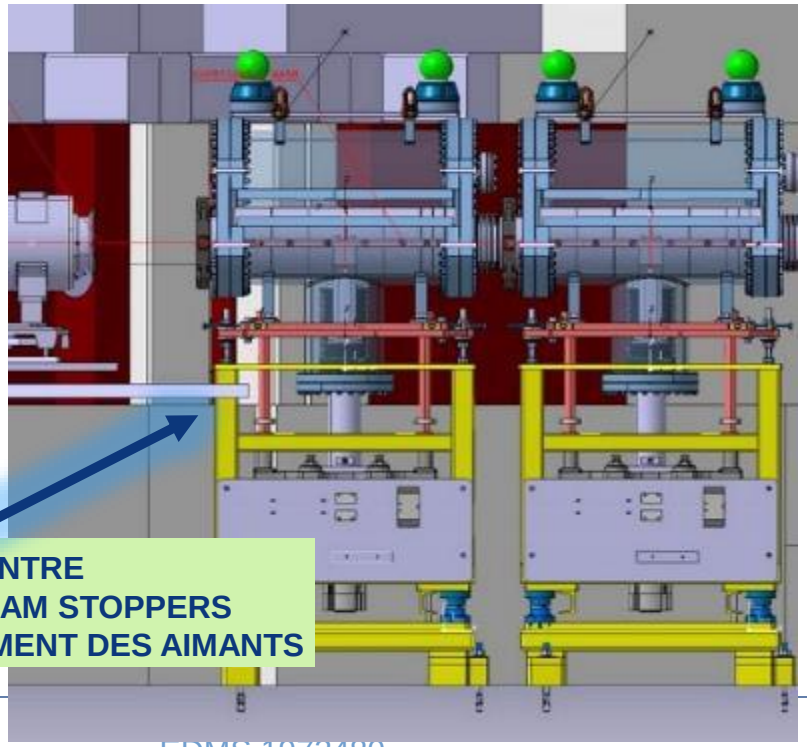
OBLIGATION DE DEMONTER UNE TRES GRANDE PARTIE DU MUR POUR MODIFIER LE CALPINAGE

Solution préférentielle: rabotage du block sur place. A voir avec CE et RP

Beam Stopper support vs sliding table

- Nota: the sliding table is bolted on his whole length to the blocks underneath
- Sol 1 (no dismantling of wall): modifying the design of the support (unknown consequences)
- Sol 2 (no dismantling of wall): cutting the plate in situ (without dismantling of the wall). Not convinced that this is feasible without moving the plate (misalignment)
- Sol 3 (part. dismantling of wall): removal of the plate, cutting ex-situ or build a new one



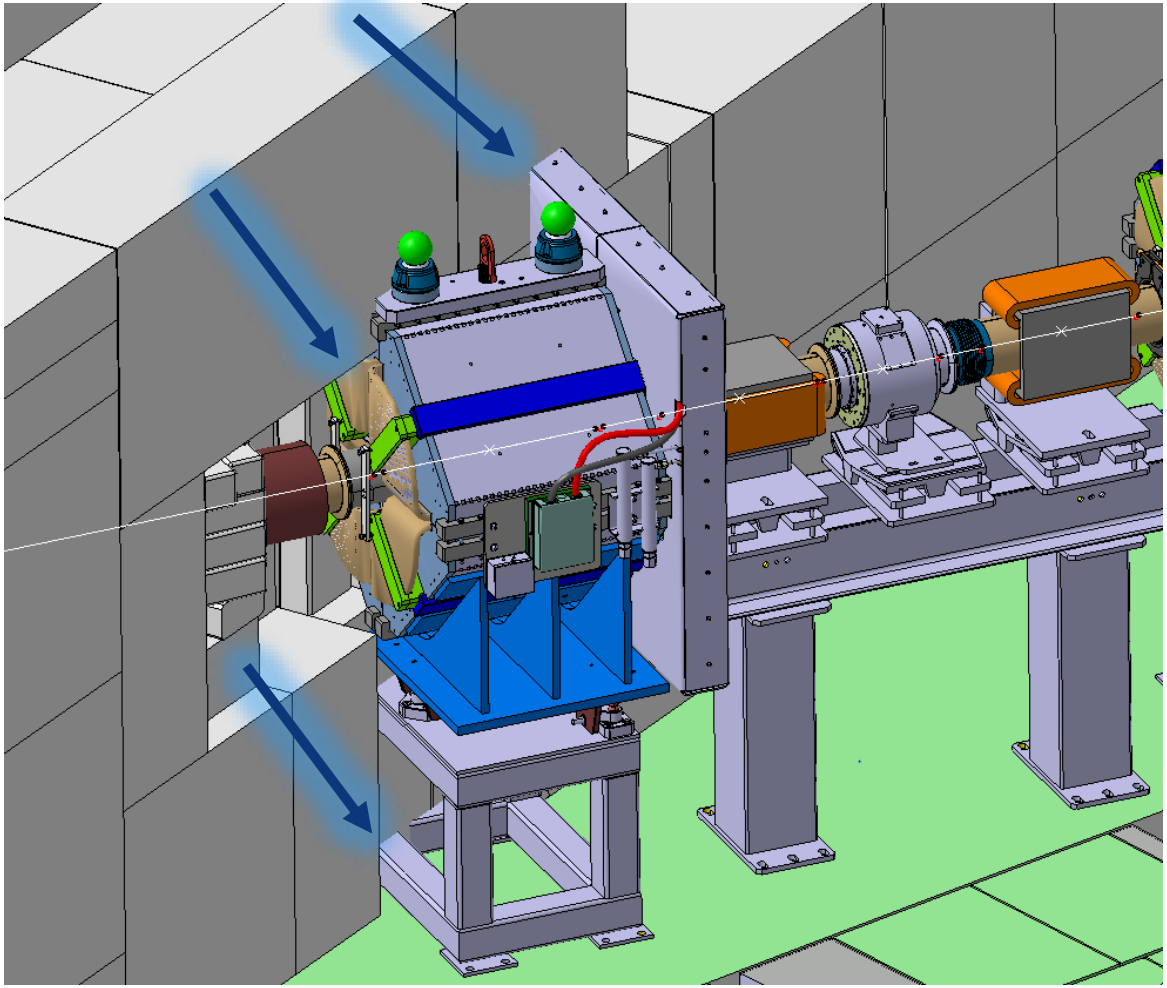


CONFLIT ENTRE
LE CHASSIS DES BEAM STOPPERS
ET LA TABLE DE ROULEMENT DES AIMANTS

PSB-PS extraction line

BLINDAGE ACTUEL COTE PS

FUTURE LIGNE EN CONFLIT AVEC LE BLINDAGE ACTUEL COTE PS



The existing shielding as such already needs to be reworked!!!

PS additional wall

- The installation of an additional shielding will require the installation of a ‘bridge’ around the present magnet (special blocks)
- The necessary machines to handle the blocks can be brought here only after one MU has been removed, meaning that the exchange of the embedded magnet will become very complex (long stop of PS)
- Moreover, part of the shielding would stand on removable floor, blocking the access to the equipment underneath

FUTURE LIGNE AVEC LE BLINDAGE ADITIONNEL EP.800 mm COTE PS

It looks much more tricky than foreseen

Conclusions

- The removal and installation of the magnet line embedded into the wall look feasible (but complex) as foreseen without the removal of the wall if:
  - The support of the beam stopper is modified
  - The tolerance/aligment/fonctionality of the existing sliding plate is accepted
- The wall can be partially dismantled to allow the replacement of the magnets and plate. It is acceptable if :
  - the block interfering with the bending magnet can be modified in situ
  - The services running along the wall can be dismantled
- The complete dismantling is very complicated, to be avoided
- The moving of 800mm thick wall on PS side is feasible but:
  - The shielding on PS side shall be completed reworked and the opening in the floor blocked
- The easier scenario in case of dismantling of the wall (partial or total) is the reinstallation as such (some few blocks can be optimized, grouped)
- In any solution:
  - The shielding wall on PS side have to be reworked to fit with the new injection line
  - The new magnet and its support shall not be wider than the actual one

Budgetwise: just a gross idea

- Partial dismantling of the wall (only handling manpower for blocks) : 1w(dis)+1w(m) ~15kCHF if stored in situ (40kCHF if stored in another building)
- Removal of services, reworking of the sliding plate: to be checked
- Removal and installation of magnets (only handling): 1 week
  - If we take 1 w for services per task, this goes to 5 weeks
- New shielding blocks for PS side: to early to say
- New shielding blocks for PSB: unknown
- Need of dismantling of the GSM cable: to be checked

Thanks for your attention!