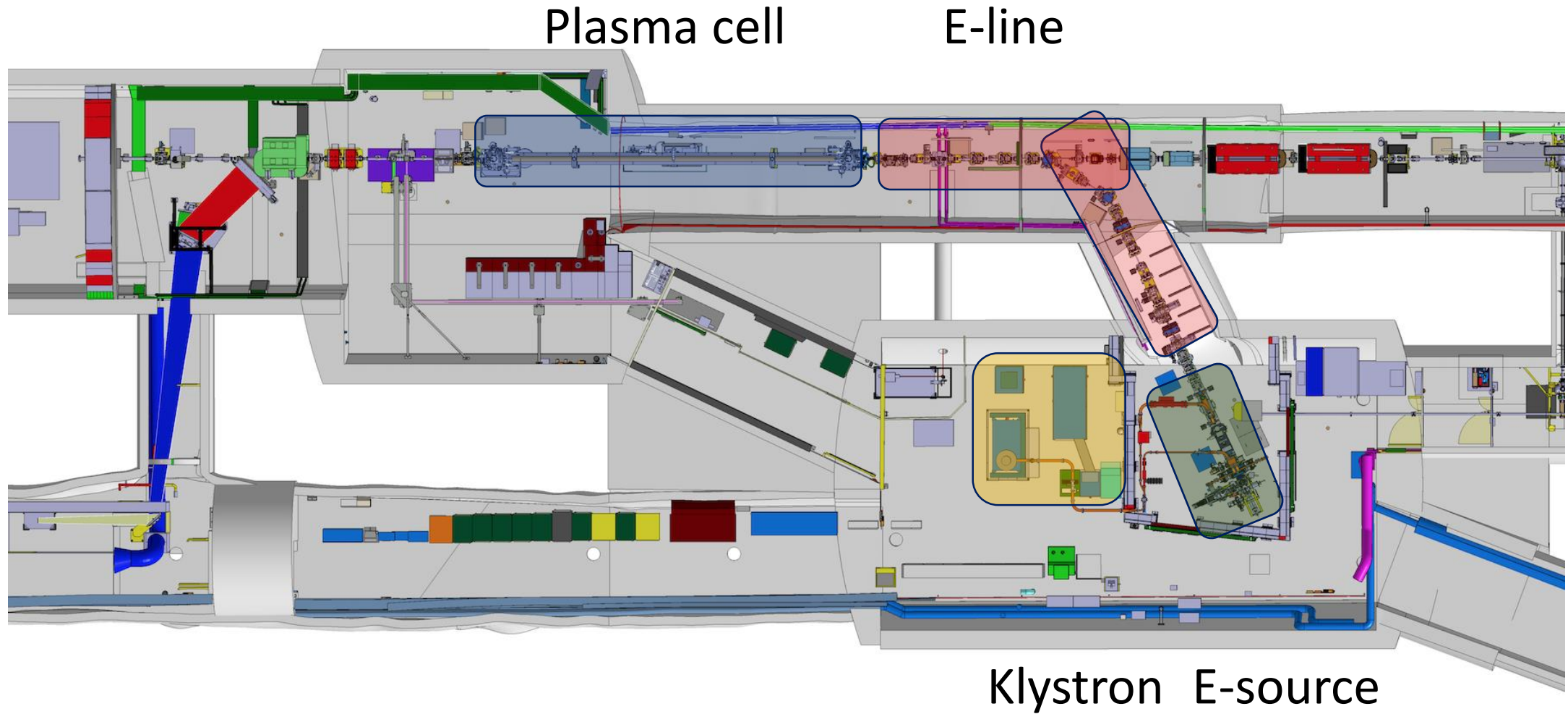


Run 2 integration studies

Introduction to integration meetings

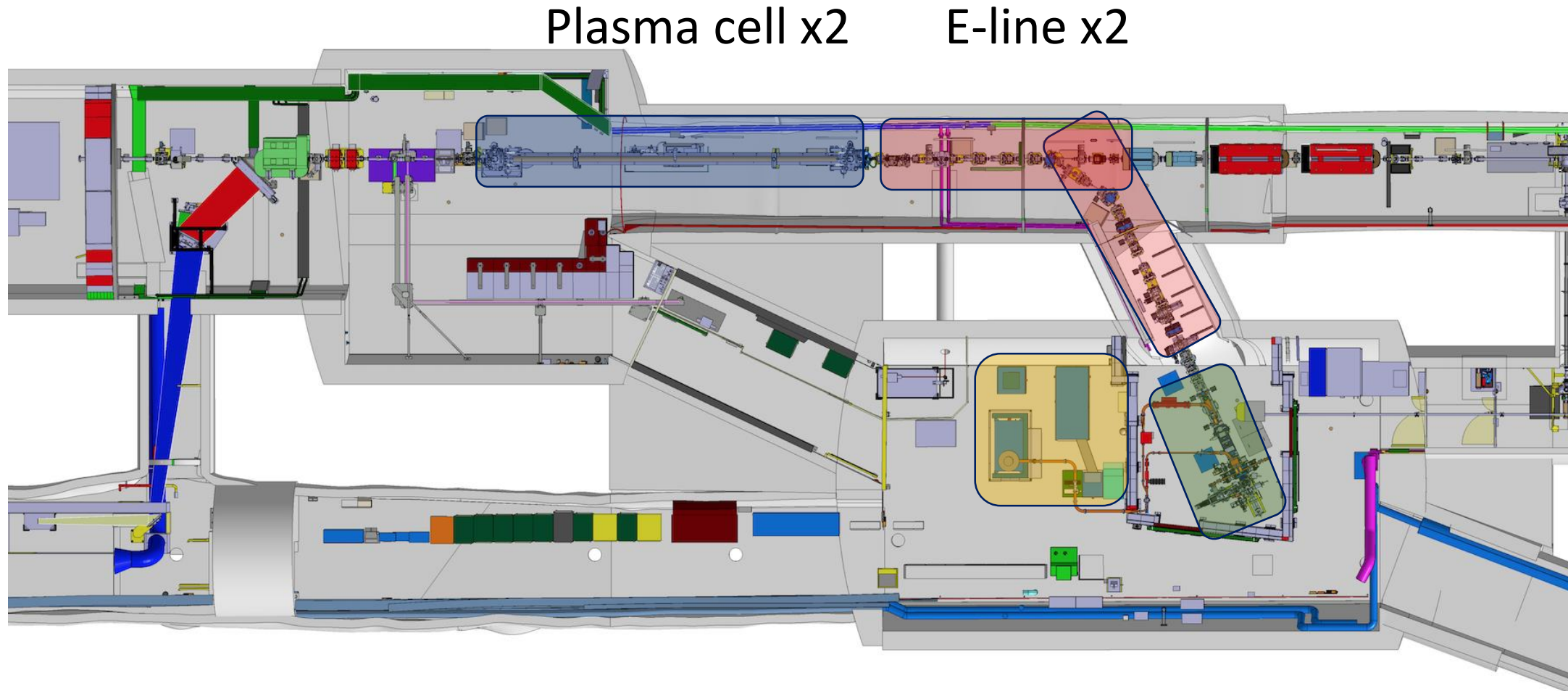
Run 1 elements

+ laser line
+...



Run 2 elements

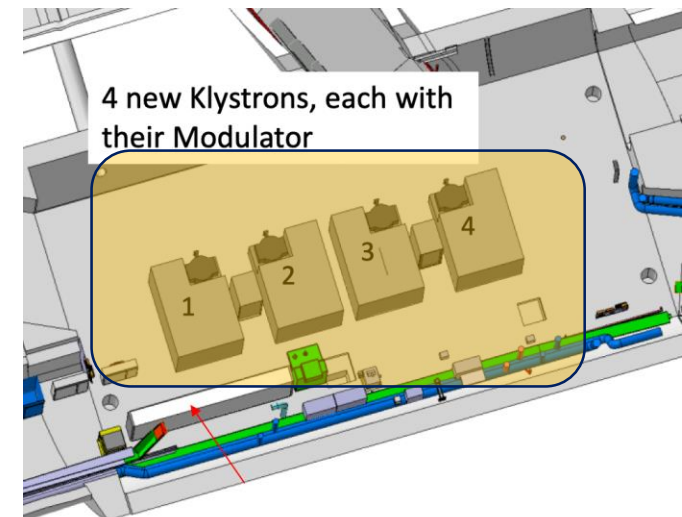
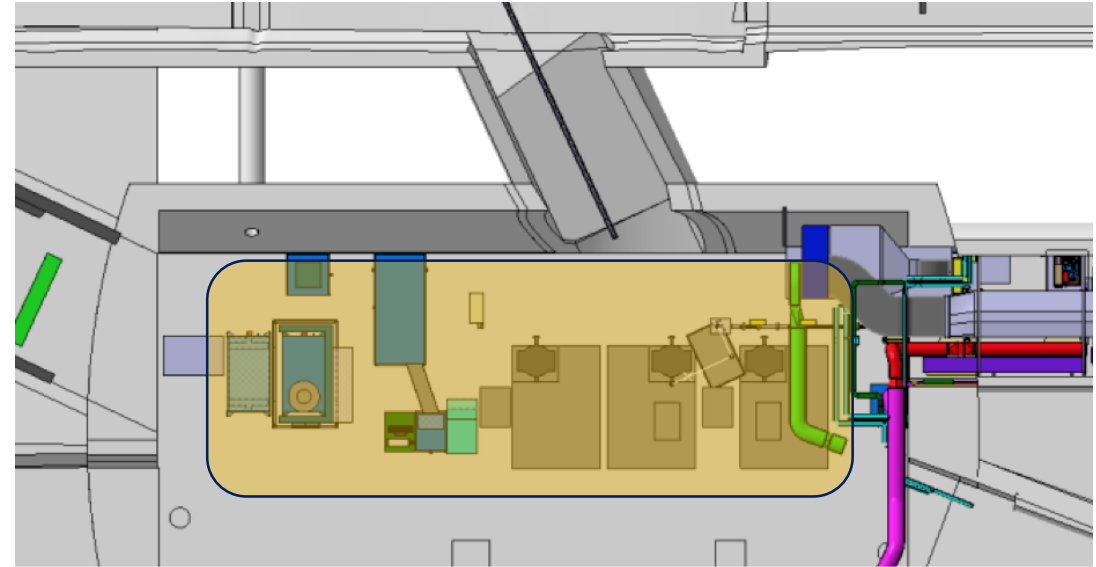
+ laser line x2
+ ...



Klystron x4 E-source x2

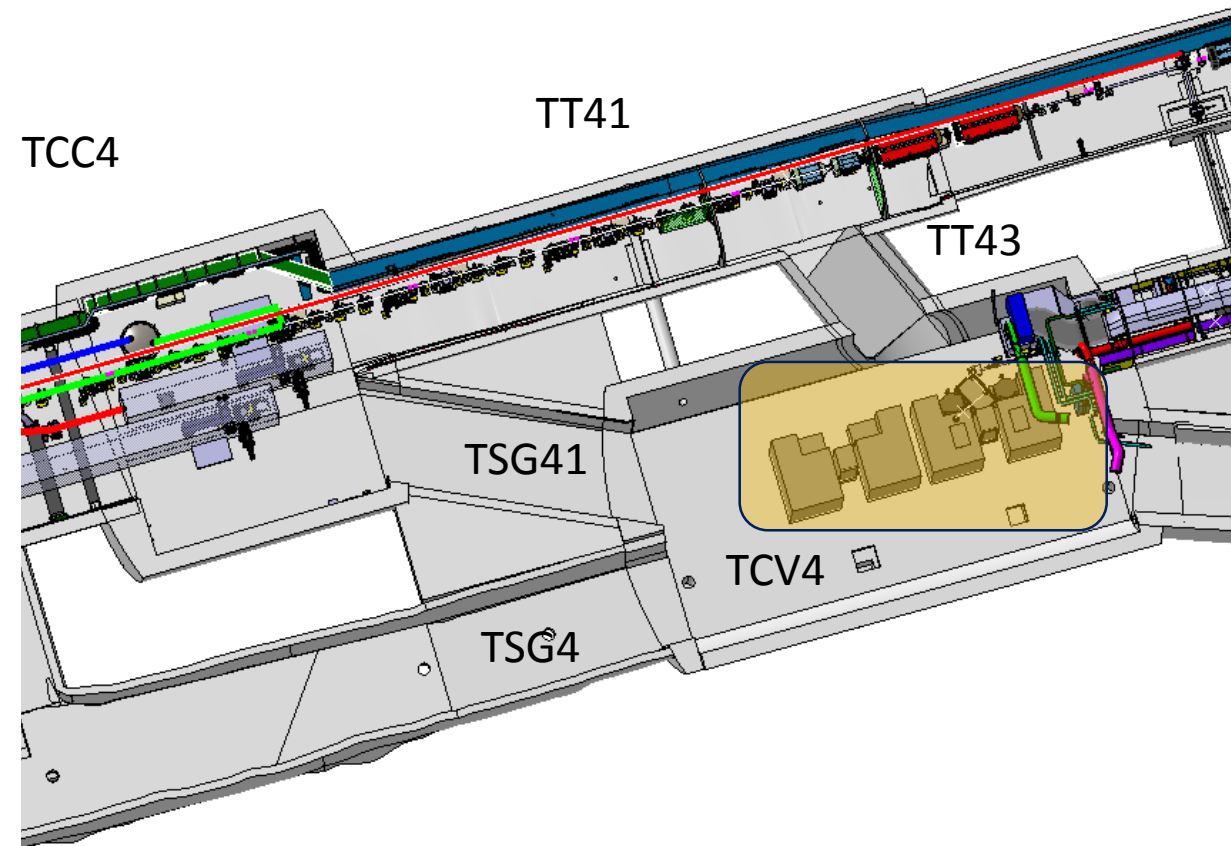
Run 2 E-sources and Klystrons

- The run 1 e-source will be used as Run 2's first e-source. Its Klystron is voluminous, more compact solutions exist now → replace.
- Run 2's second e-source is new and needs 3x as much volume in Klystron.
- Klystrons need large free height for installation and repair
 - Only TCV4 can host Klystrons
 - E-source nr 1 must move elsewhere
 - E-line nr 1 must move elsewhere



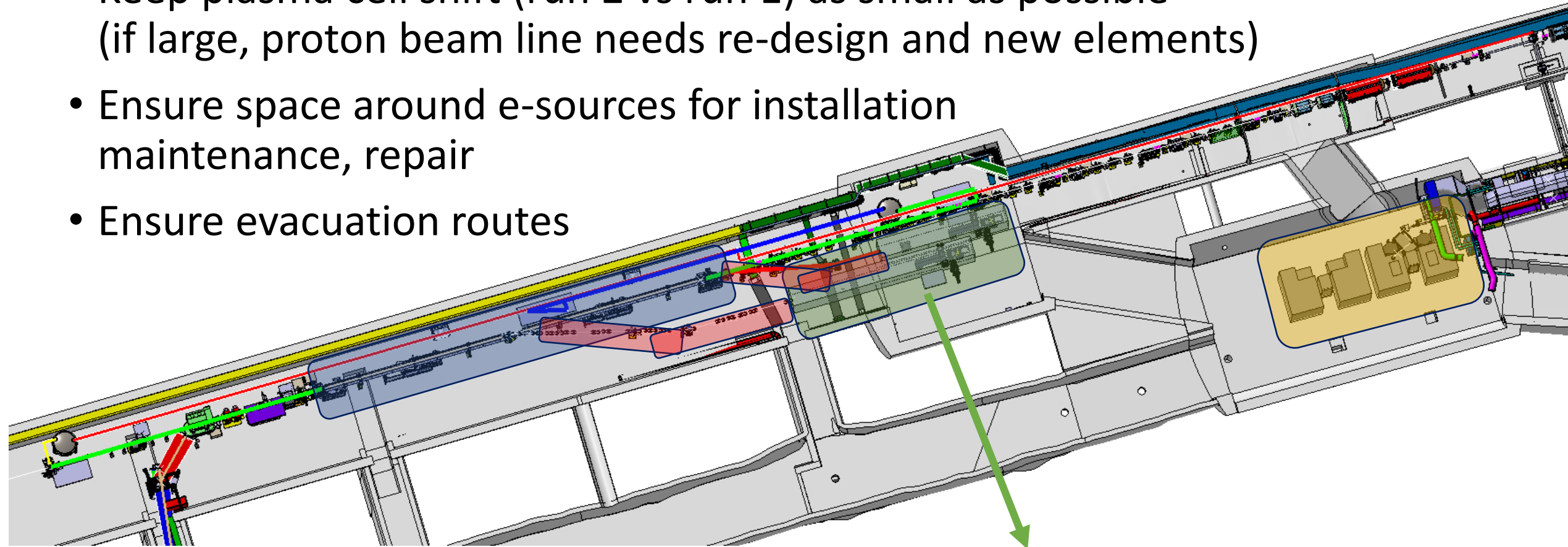
Run 2 E-sources and e-lines

- 4 Klystrons in TCV4
- New location for e-sources needed
- E-sources too wide and too high to fit in TT41, TT43, TSG4, TSG41 etc.
- E-sources fit only in TCC4
- E-sources shift downstream
- E-lines as well as plasma cells shift downstream



Run 2 Elements

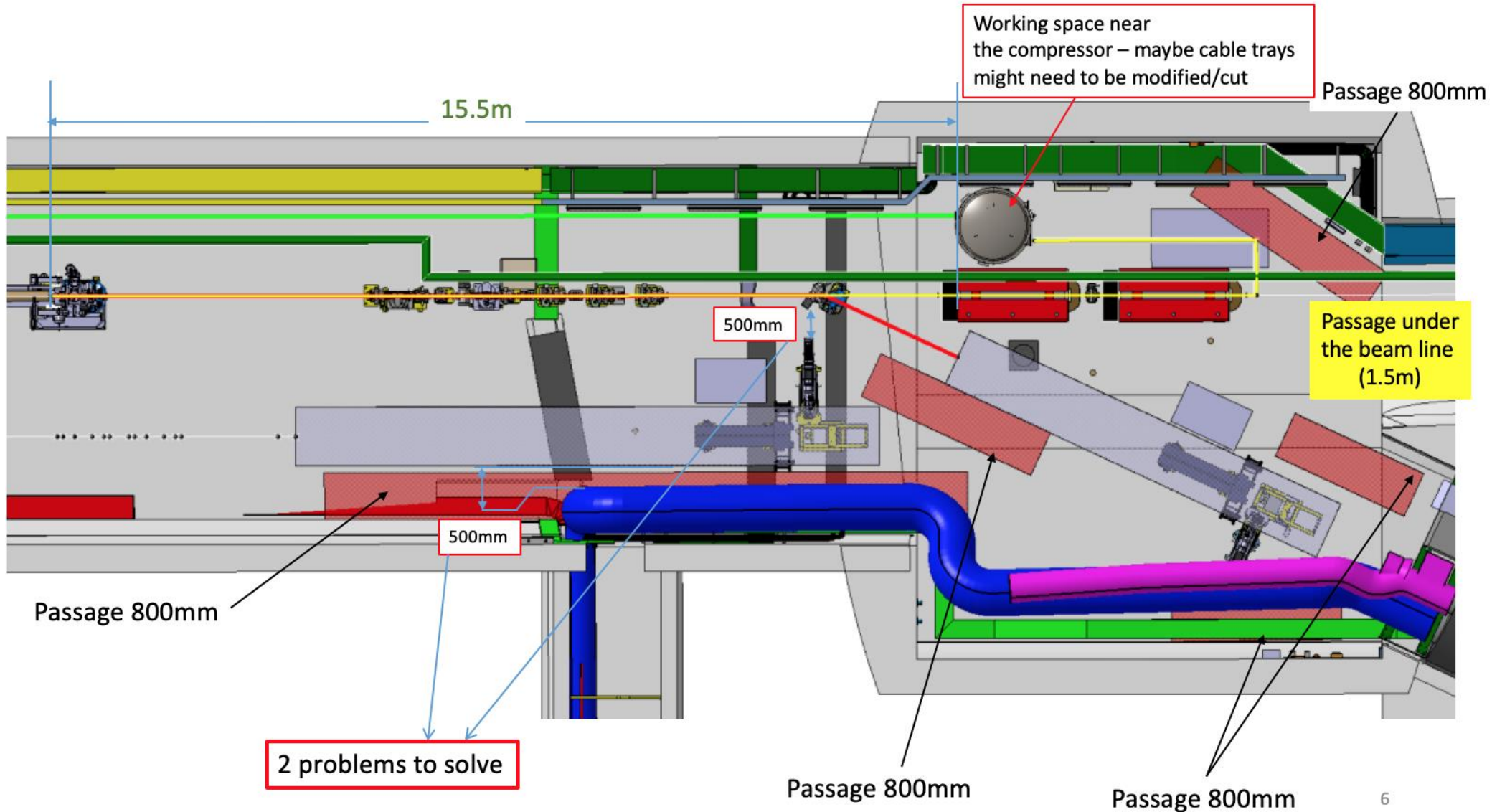
- Keep plasma cell shift (run 2 vs run 1) as small as possible (if large, proton beam line needs re-design and new elements)
- Ensure space around e-sources for installation maintenance, repair
- Ensure evacuation routes



This E-source configuration is not possible because lack of space for operation and installation

Run 2 Integration – a typical day

Bring MB190 dipoles downstream to allow laser mirror more downstream



Run 2 integration studies

- Require detailed and iterative discussions between integration team and the main equipment and service experts. We (integration team) do not know how your equipment works, but we need to know a lot about it!
 - which space/volume it uses
 - which connections it needs (water, electricity), which services (crane)
 - proximity to other elements
 - effect from and on environment
 - consequences of “compromise” when requested solution is not possible (performance, cost, schedule, ...)
- Be warned: we will ask a lot of questions and will come back to you again and again and again