

## Risk report for project - TS, Target

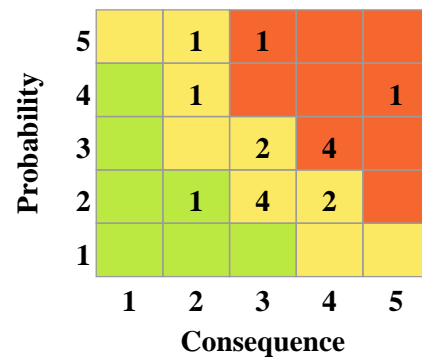
### Current filter

**Risk category:** Infrastructure, NSS, Target, Accelerator, ICS, Operations, ES&H and QA, Project support and Administration, Engineering and Integration Support **WBS:** WP2 Target Systems **Selected period:** remaining part of 2016

The budget of the project in this risk register is **162,416 k€** and the total cost of the treatment plan is **2,120 k€**.

### The Most Severe Risks

Total **17 pcs.** risks, of which  
**0 pcs.** to treat  
**17 pcs.** under treatment  
**0 pcs.** to accept  
**0 pcs.** accepted



#### Net - Top 5 risks

- 62 - Design interface data exchange between ESS and in-kind partners, and between two or more partners, is not properly defined or managed
- 3 - Licensing frame for ESS target station is not well defined, or is changed
- 43 - Design and interface information given to CF too late; installation concurrent with civil construction is complicated.
- 8 - In-kind partners do not deliver full scope or on time
- 36 - Inadequate budget identified for Target Station scope

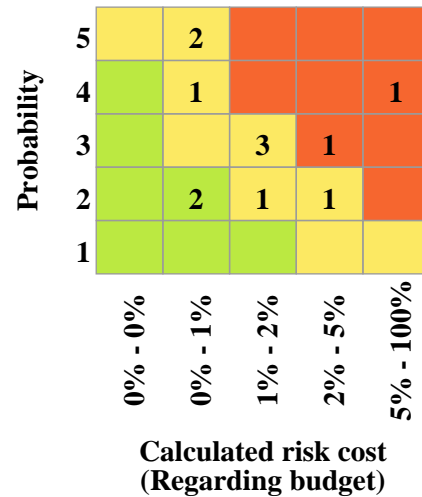
Shows risk products. For min/max/likely consequences the probable outcome is shown between brackets.

Risk owner	Id	Event	Date	Cost (k€)	Personal injuries	Annual operation costs	Goodwill	Quality and function	Schedule	Surroundings
Eric Pitcher	62	Design interface data exchange between ESS and in-kind partners, and between two or more partners, is not properly defined or managed	4/1/16 - 12/31/19	10 (1314)	5	15	5	15	10	10
Eric Pitcher	3	Licensing frame for ESS target station is not well defined, or is changed	2/1/14 - 12/31/19	9 (1120)		6	9	12	12	
Eric Pitcher	43	Design and interface information given to CF too late; installation concurrent with civil construction is complicated.	4/8/14 - 12/31/18	12 (1190)		6		9	12	
Eric Pitcher	8	In-kind partners do not deliver full scope or on time	2/11/14 - 3/31/19				12	9	12	
Eric Pitcher	36	Inadequate budget identified for Target Station scope	4/1/14 - 3/31/19	20 (11700)		8				






## Risk profiles

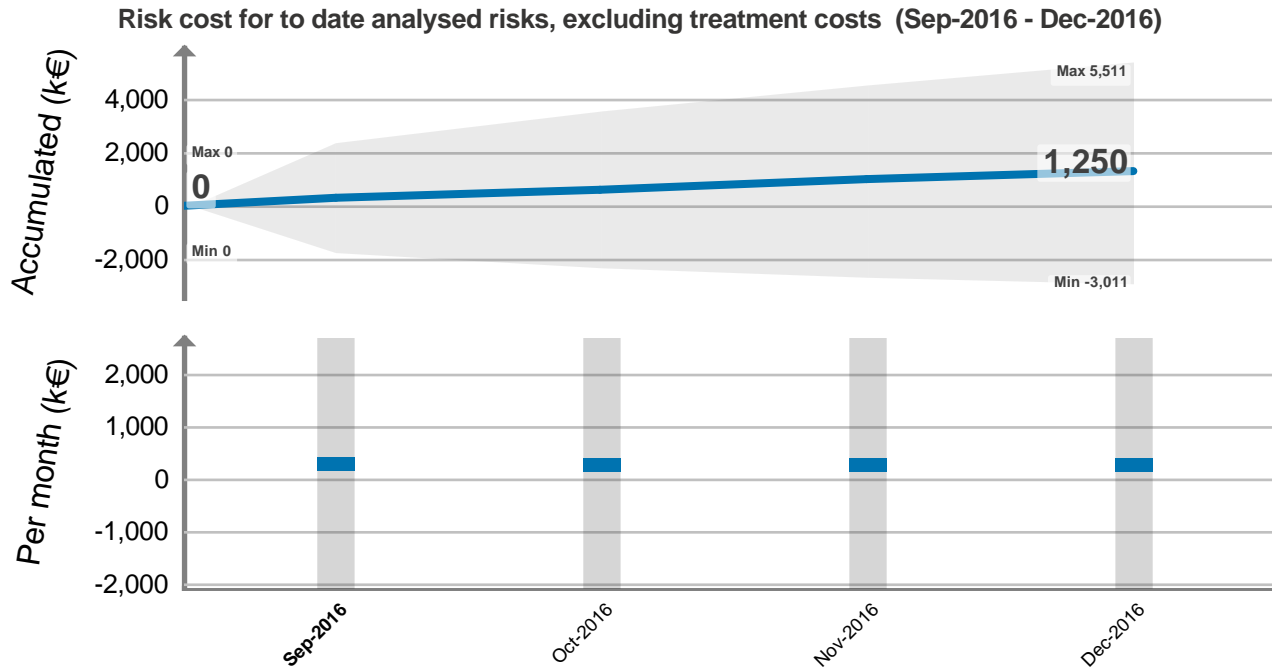
### Risk concerning Cost

Total **12 pcs.** risks, of which  
**0 pcs.** to treat  
**12 pcs.** under treatment  
**0 pcs.** to accept  
**0 pcs.** accepted



#### Net - Top 5 risks

-  36 - Inadequate budget identified for Target Station scope
-  43 - Design and interface information given to CF too late; installation concurrent with civil construction is complicated.
-  62 - Design interface data exchange between ESS and in-kind partners, and between two or more partners, is not properly defined or managed
-  3 - Licensing frame for ESS target station is not well defined, or is changed
-  2 - The target project scope is split into many independent items



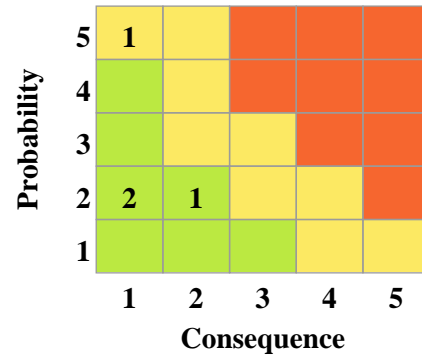
**The top risks, descending order**

Risk owner	Id	Event	Cause	Impact	Date	Treatment status	Probable outcome
Eric Pitcher	36	Inadequate budget identified for Target Station scope	<ul style="list-style-type: none"> <li>Budget and schedule is fixed</li> <li>Cost estimate made early in the design</li> <li>Difficult or impossible to recover budget distributed to in-kind partners through value engineering once the scope has been assigned.</li> </ul>	TS cannot deliver according to stakeholders expectations	4/1/14 - 3/31/19	Started	11700

Risk owner	Id	Event	Cause	Impact	Date	Treatment status	Probable outcome
Eric Pitcher	43	Design and interface information given to CF too late; installation concurrent with civil construction is complicated.	<ul style="list-style-type: none"> <li>• Early construction requires information to be transmitted to CF before the Target Station design is fully mature</li> <li>• Interface is complicated; Target building must be constructed while the Target Station is being installed.</li> </ul>	Higher cost, schedule delays.	4/8/14 - 12/31/18	Started	<b>1190</b>
Eric Pitcher	62	Design interface data exchange between ESS and in-kind partners, and between two or more partners, is not properly defined or managed	CAD model exchange is not done on a regular basis from in-kind partners	Interface definitions are not regularly updated which leads to incompatible components delivered by partners.	4/1/16 - 12/31/19	Started	<b>1314</b>
Eric Pitcher	3	Licensing frame for ESS target station is not well defined, or is changed	<ul style="list-style-type: none"> <li>• Lack of regulatory framework for ESS type project in Sweden</li> <li>• The external safety requirements (SSM) are changing after PDR impacting TS in an unanticipated manner.</li> </ul>	Licensing requirements modification requiring re-design	2/1/14 - 12/31/19	Started	<b>1120</b>
Eric Pitcher	2	The target project scope is split into many independent items	Drive to involve in-kind partners, who may be interested only in small pieces of our scope	Unnecessarily complicated interface management and considerable delays	2/7/14 - 12/31/19	Started	<b>700</b>

## Risk concerning Personal injuries

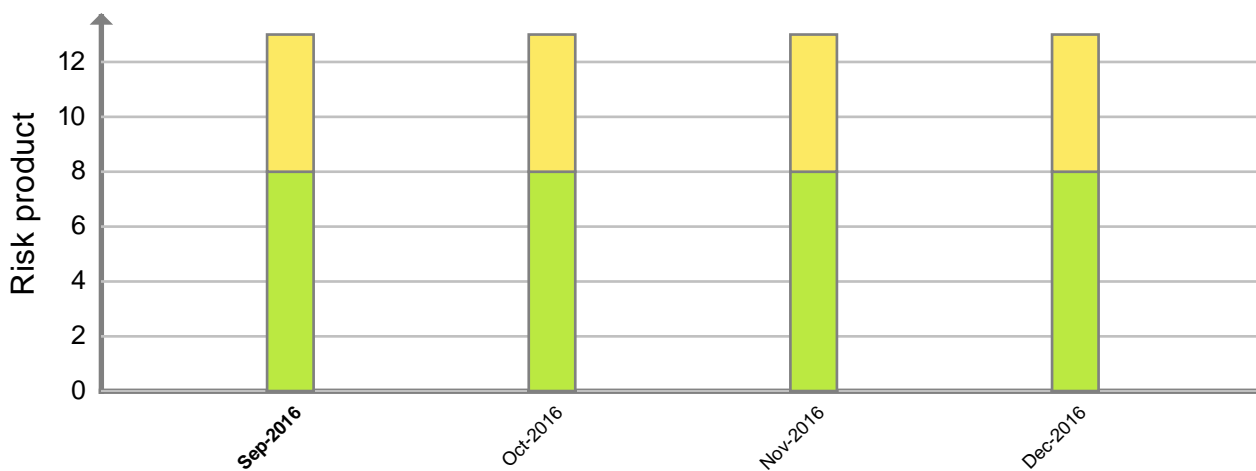
Total **4 pcs.** risks, of which  
**0 pcs.** to treat  
**4 pcs.** under treatment  
**0 pcs.** to accept  
**0 pcs.** accepted



### Net - Top 5 risks

- 62 - Design interface data exchange between ESS and in-kind partners, and between two or more partners, is not properly defined or managed
- 34 - Solution for the open monolith situation is not suitable or too challenging.
- 6 - Lack of design progress (simulation/optimization time and prototyping)
- 4 - Some components do not meet technical or quality requirements

Risk product over time for to date analysed risks (Sep-2016 - Dec-2016)

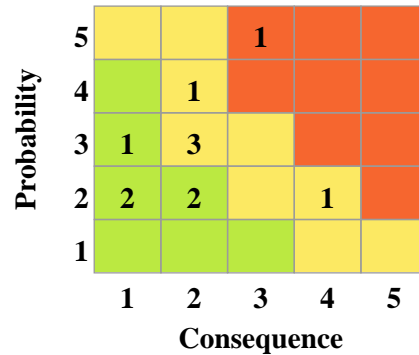


**The top risks, descending order**

Risk owner	Id	Event	Cause	Impact	Date	Treatment status	RP
Eric Pitcher	62	Design interface data exchange between ESS and in-kind partners, and between two or more partners, is not properly defined or managed	CAD model exchange is not done on a regular basis from in-kind partners	Interface definitions are not regularly updated which leads to incompatible components delivered by partners.	4/1/16 - 12/31/19	Started	5
Rikard Linander	34	Solution for the open monolith situation is not suitable or too challenging.	Requirements for an open monolith situation are unclear or too conservative (unrealistic)	Failure to meet specification. Operations and maintenance cost as well as maintenance schedules are higher/longer than expected.	1/1/15 - 12/31/19	Started	4
Eric Pitcher	6	Lack of design progress (simulation/optimization time and prototyping)	<ul style="list-style-type: none"> <li>• Poor communication within the project or towards inkind partners</li> <li>• Poor overall design integration within target</li> <li>• Poor alignment regarding design and requirements/limitations between Target and other ESS projects</li> <li>• Delays in building up staff resources while waiting to align staff with in-kind partners</li> </ul>	Late design changes that cause increased cost and delay	2/11/14 - 3/31/19	Started	2
John Haines	4	Some components do not meet technical or quality requirements	<ul style="list-style-type: none"> <li>• Quality lacking from specifications</li> <li>• Poor collaboration with suppliers or InKind partners</li> </ul>	Design changes entailing increased cost and schedule delays	2/11/14 - 6/29/18	Started	2

### Risk concerning Annual operation costs

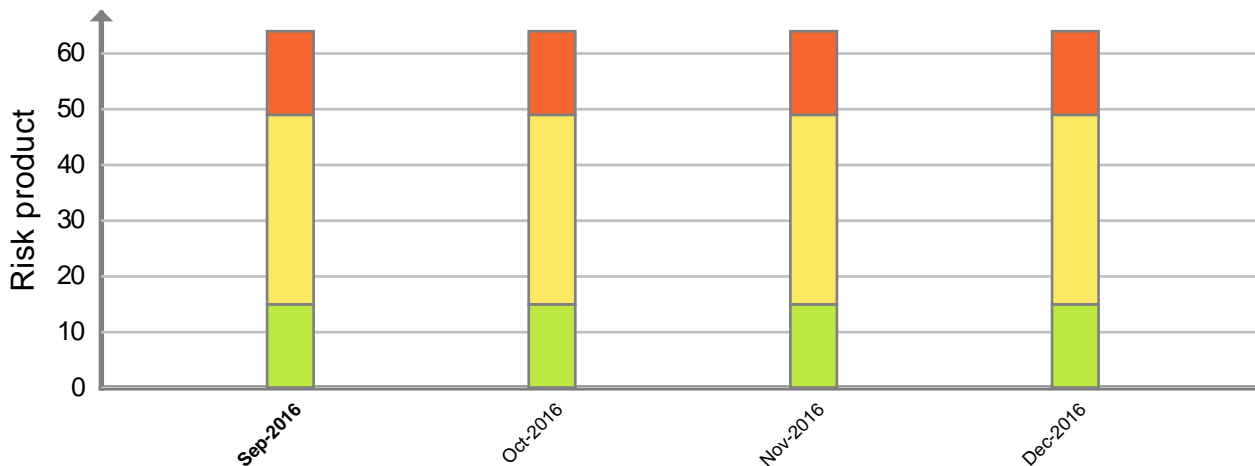
Total **11 pcs.** risks, of which  
**0 pcs.** to treat  
**11 pcs.** under treatment  
**0 pcs.** to accept  
**0 pcs.** accepted



#### Net - Top 5 risks

- 62 - Design interface data exchange between ESS and in-kind partners, and between two or more partners, is not properly defined or managed
- 36 - Inadequate budget identified for Target Station scope
- 34 - Solution for the open monolith situation is not suitable or too challenging.
- 43 - Design and interface information given to CF too late; installation concurrent with civil construction is complicated.
- 42 - Incompatible controls or missing controls for Target within ICS.

Risk product over time for to date analysed risks (Sep-2016 - Dec-2016)



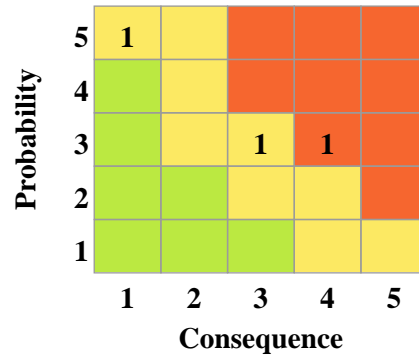


**The top risks, descending order**




Risk owner	Id	Event	Cause	Impact	Date	Treatment status	RP
Eric Pitcher	62	Design interface data exchange between ESS and in-kind partners, and between two or more partners, is not properly defined or managed	CAD model exchange is not done on a regular basis from in-kind partners	Interface definitions are not regularly updated which leads to incompatible components delivered by partners.	4/1/16 - 12/31/19	Started	15
Eric Pitcher	36	Inadequate budget identified for Target Station scope	<ul style="list-style-type: none"> <li>Budget and schedule is fixed</li> <li>Cost estimate made early in the design</li> <li>Difficult or impossible to recover budget distributed to in-kind partners through value engineering once the scope has been assigned.</li> </ul>	TS cannot deliver according to stakeholders expectations	4/1/14 - 3/31/19	Started	8
Rikard Linander	34	Solution for the open monolith situation is not suitable or too challenging.	Requirements for an open monolith situation are unclear or too conservative (unrealistic)	Failure to meet specification. Operations and maintenance cost as well as maintenance schedules are higher/longer than expected.	1/1/15 - 12/31/19	Started	8
Eric Pitcher	43	Design and interface information given to CF too late; installation concurrent with civil construction is complicated.	<ul style="list-style-type: none"> <li>Early construction requires information to be transmitted to CF before the Target Station design is fully mature</li> <li>Interface is complicated; Target building must be constructed while the Target Station is being installed.</li> </ul>	Higher cost, schedule delays.	4/8/14 - 12/31/18	Started	6
Linda Coney	42	Incompatible controls or missing controls for Target within ICS.	Improperly understood or defined interfaces between Target controls-ICS	Gaps, double coverage and/or inability to understand interface(s)	4/9/14 - 12/31/16	Started	6

## Risk concerning Goodwill

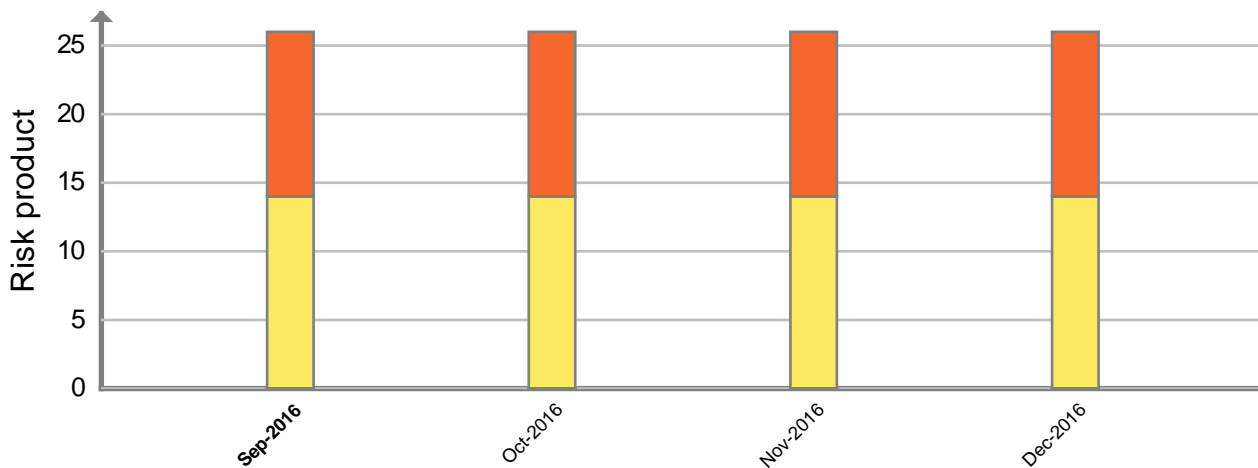
Total **3 pcs.** risks, of which  
**0 pcs.** to treat  
**3 pcs.** under treatment  
**0 pcs.** to accept  
**0 pcs.** accepted



### Net - Top 5 risks

-  8 - In-kind partners do not deliver full scope or on time
-  3 - Licensing frame for ESS target station is not well defined, or is changed
-  62 - Design interface data exchange between ESS and in-kind partners, and between two or more partners, is not properly defined or managed

Risk product over time for to date analysed risks (Sep-2016 - Dec-2016)

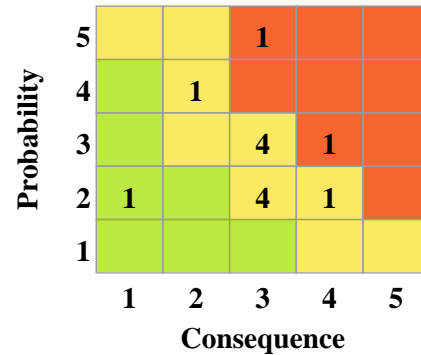


**The top risks, descending order**






Risk owner	Id	Event	Cause	Impact	Date	Treatment status	RP
Eric Pitcher	8	In-kind partners do not deliver full scope or on time	<ul style="list-style-type: none"> <li>• Lack of clarity in in-kind agreements</li> <li>• Lack of involvement with and oversight of in-kind partners</li> <li>• Inappropriate selection of in-kind partners to perform the stated scope</li> </ul>	Exceeding budget, delaying schedule and/or lower quality or performance (technical scope)	2/11/14 - 3/31/19	Started	12
Eric Pitcher	3	Licensing frame for ESS target station is not well defined, or is changed	<ul style="list-style-type: none"> <li>• Lack of regulatory framework for ESS type project in Sweden</li> <li>• The external safety requirements (SSM) are changing after PDR impacting TS in an unanticipated manner.</li> </ul>	Licensing requirements modification requiring re-design	2/1/14 - 12/31/19	Started	9
Eric Pitcher	62	Design interface data exchange between ESS and in-kind partners, and between two or more partners, is not properly defined or managed	CAD model exchange is not done on a regular basis from in-kind partners	Interface definitions are not regularly updated which leads to incompatible components delivered by partners.	4/1/16 - 12/31/19	Started	5

## Risk concerning Quality and function

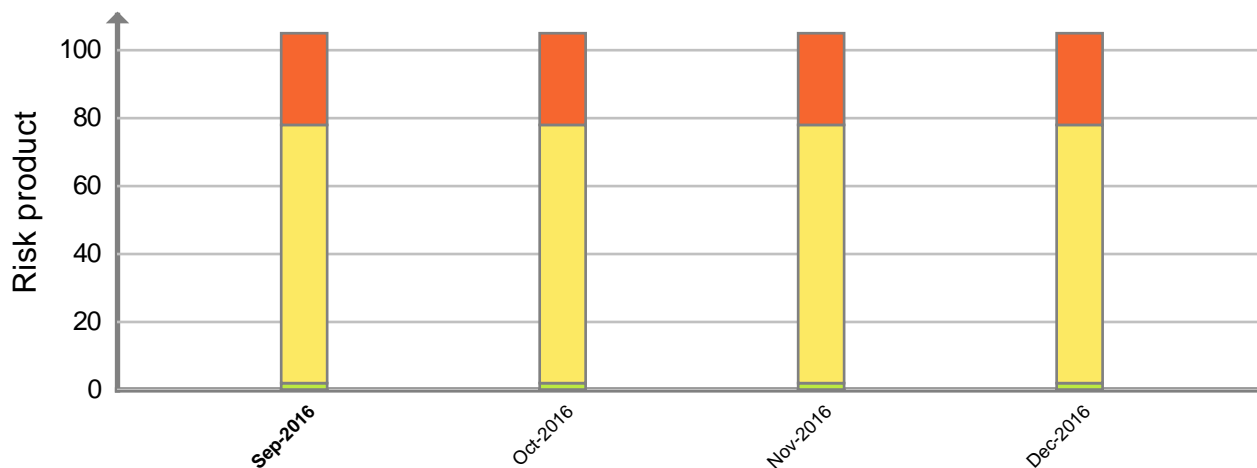
Total **13 pcs.** risks, of which  
**0 pcs.** to treat  
**13 pcs.** under treatment  
**0 pcs.** to accept  
**0 pcs.** accepted



### Net - Top 5 risks

-  62 - Design interface data exchange between ESS and in-kind partners, and between two or more partners, is not properly defined or managed
-  3 - Licensing frame for ESS target station is not well defined, or is changed
-  43 - Design and interface information given to CF too late; installation concurrent with civil construction is complicated.
-  8 - In-kind partners do not deliver full scope or on time
-  42 - Incompatible controls or missing controls for Target within ICS.

Risk product over time for to date analysed risks (Sep-2016 - Dec-2016)

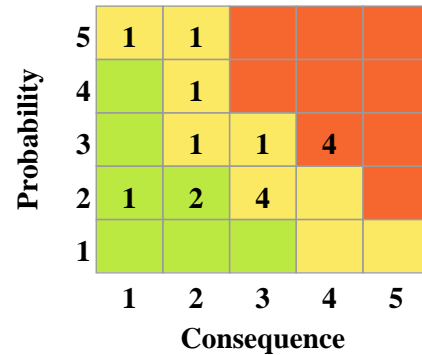


**The top risks, descending order**

Risk owner	Id	Event	Cause	Impact	Date	Treatment status	RP
Eric Pitcher	62	Design interface data exchange between ESS and in-kind partners, and between two or more partners, is not properly defined or managed	CAD model exchange is not done on a regular basis from in-kind partners	Interface definitions are not regularly updated which leads to incompatible components delivered by partners.	4/1/16 - 12/31/19	Started	15
Eric Pitcher	3	Licensing frame for ESS target station is not well defined, or is changed	<ul style="list-style-type: none"> <li>• Lack of regulatory framework for ESS type project in Sweden</li> <li>• The external safety requirements (SSM) are changing after PDR impacting TS in an unanticipated manner.</li> </ul>	Licensing requirements modification requiring re-design	2/1/14 - 12/31/19	Started	12
Eric Pitcher	43	Design and interface information given to CF too late; installation concurrent with civil construction is complicated.	<ul style="list-style-type: none"> <li>• Early construction requires information to be transmitted to CF before the Target Station design is fully mature</li> <li>• Interface is complicated; Target building must be constructed while the Target Station is being installed.</li> </ul>	Higher cost, schedule delays.	4/8/14 - 12/31/18	Started	9
Eric Pitcher	8	In-kind partners do not deliver full scope or on time	<ul style="list-style-type: none"> <li>• Lack of clarity in in-kind agreements</li> <li>• Lack of involvement with and oversight of in-kind partners</li> <li>• Inappropriate selection of in-kind partners to perform the stated scope</li> </ul>	Exceeding budget, delaying schedule and/or lower quality or performance (technical scope)	2/11/14 - 3/31/19	Started	9
Linda Coney	42	Incompatible controls or missing controls for Target within ICS.	Improperly understood or defined interfaces between Target controls-ICS	Gaps, double coverage and/or inability to understand interface(s)	4/9/14 - 12/31/16	Started	9

## Risk concerning Schedule

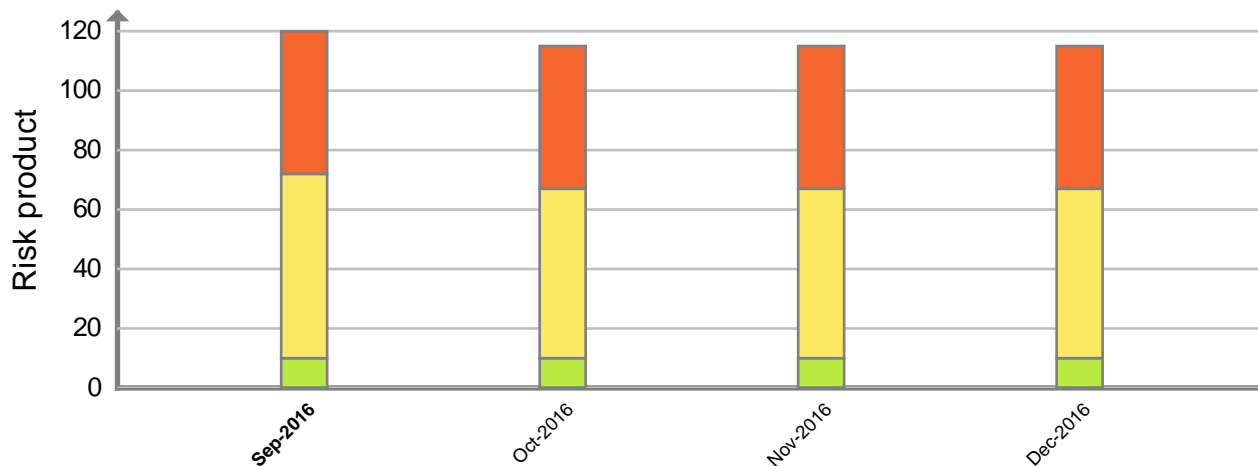
Total **16 pcs.** risks, of which  
**0 pcs.** to treat  
**16 pcs.** under treatment  
**0 pcs.** to accept  
**0 pcs.** accepted



### Net - Top 5 risks

- 43 - Design and interface information given to CF too late; installation concurrent with civil construction is complicated.
- 54 - Difficulty transitioning from ESS-Lund led Preliminary Design to IKC-partner led Final Design (for many systems)
- 8 - In-kind partners do not deliver full scope or on time
- 3 - Licensing frame for ESS target station is not well defined, or is changed
- 62 - Design interface data exchange between ESS and in-kind partners, and between two or more partners, is not properly defined or managed

Risk product over time for to date analysed risks (Sep-2016 - Dec-2016)

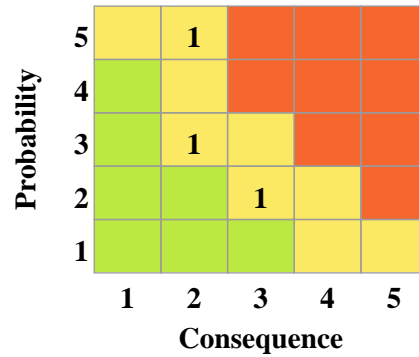


**The top risks, descending order**

Risk owner	Id	Event	Cause	Impact	Date	Treatment status	RP
Eric Pitcher	43	Design and interface information given to CF too late; installation concurrent with civil construction is complicated.	<ul style="list-style-type: none"> <li>• Early construction requires information to be transmitted to CF before the Target Station design is fully mature</li> <li>• Interface is complicated; Target building must be constructed while the Target Station is being installed.</li> </ul>	Higher cost, schedule delays.	4/8/14 - 12/31/18	Started	12
John Haines	54	Difficulty transitioning from ESS-Lund led Preliminary Design to IKC-partner led Final Design (for many systems)	<ul style="list-style-type: none"> <li>• Misunderstandings of IKC scope</li> <li>• Build up in partner staffing is too slow</li> <li>• Design information not adequately transferred to partner</li> </ul>	Schedule delays	10/11/15 - 12/24/16	Started	12
Eric Pitcher	8	In-kind partners do not deliver full scope or on time	<ul style="list-style-type: none"> <li>• Lack of clarity in in-kind agreements</li> <li>• Lack of involvement with and oversight of in-kind partners</li> <li>• Inappropriate selection of in-kind partners to perform the stated scope</li> </ul>	Exceeding budget, delaying schedule and/or lower quality or performance (technical scope)	2/11/14 - 3/31/19	Started	12
Eric Pitcher	3	Licensing frame for ESS target station is not well defined, or is changed	<ul style="list-style-type: none"> <li>• Lack of regulatory framework for ESS type project in Sweden</li> <li>• The external safety requirements (SSM) are changing after PDR impacting TS in an unanticipated manner.</li> </ul>	Licensing requirements modification requiring re-design	2/1/14 - 12/31/19	Started	12
Eric Pitcher	62	Design interface data exchange between ESS and in-kind partners, and between two or more partners, is not properly defined or managed	CAD model exchange is not done on a regular basis from in-kind partners	Interface definitions are not regularly updated which leads to incompatible components delivered by partners.	4/1/16 - 12/31/19	Started	10

## Risk concerning Surroundings

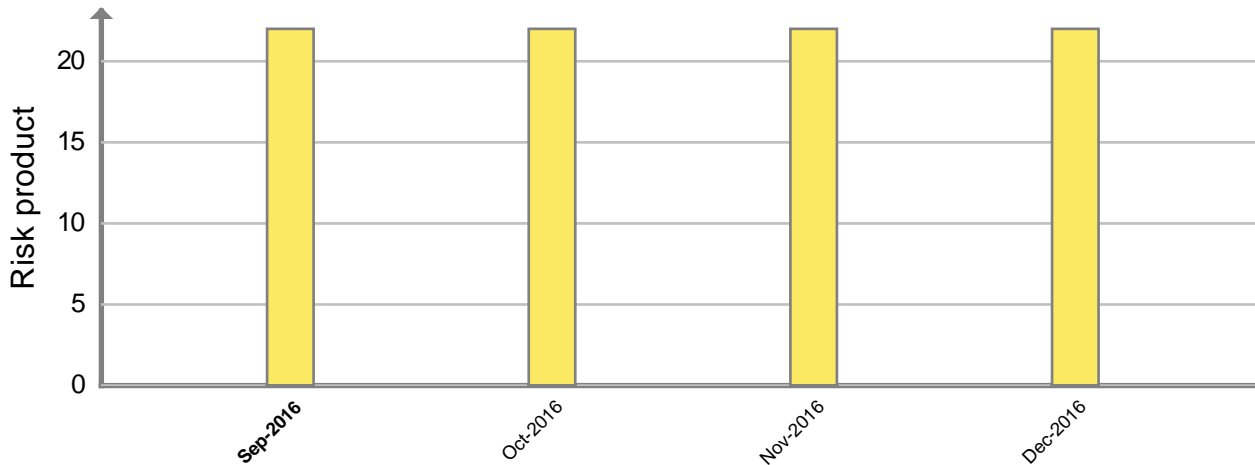
Total **3 pcs.** risks, of which  
**0 pcs.** to treat  
**3 pcs.** under treatment  
**0 pcs.** to accept  
**0 pcs.** accepted



### Net - Top 5 risks

- 62 - Design interface data exchange between ESS and in-kind partners, and between two or more partners, is not properly defined or managed
- 42 - Incompatible controls or missing controls for Target within ICS.
- 34 - Solution for the open monolith situation is not suitable or too challenging.

Risk product over time for to date analysed risks (Sep-2016 - Dec-2016)





**The top risks, descending order**

Risk owner	Id	Event	Cause	Impact	Date	Treatment status	RP
Eric Pitcher	62	Design interface data exchange between ESS and in-kind partners, and between two or more partners, is not properly defined or managed	CAD model exchange is not done on a regular basis from in-kind partners	Interface definitions are not regularly updated which leads to incompatible components delivered by partners.	4/1/16 - 12/31/19	Started	10
Linda Coney	42	Incompatible controls or missing controls for Target within ICS.	Improperly understood or defined interfaces between Target controls-ICS	Gaps, double coverage and/or inability to understand interface(s)	4/9/14 - 12/31/16	Started	6
Rikard Linander	34	Solution for the open monolith situation is not suitable or too challenging.	Requirements for an open monolith situation are unclear or too conservative (unrealistic)	Failure to meet specification. Operations and maintenance cost as well as maintenance schedules are higher/longer than expected.	1/1/15 - 12/31/19	Started	6