

Checklist	Remarks	Action (X)						
<p style="text-align: center;">Project System Audit Systems Engineering Group</p> <p>Note: Not all items of the checklist shall be checked. It depends on the status of the work and whether it is the first, second or third audit.</p> <p>⊗ = question is HE&S related.</p> <p>1. Project Definition</p> <p>1.1 Is the Project Procedure and Execution Manual (PPEM) available? What is the status, issue and date?</p> <p>1.2 Does the PPEM properly describe the scope of work and services expected from your discipline to execute the work?</p> <p>1.3 How has been defined what level of detail is to be shown on EFD's?</p> <p>1.4 Does the PPEM properly describe issue codes and related issue descriptions?</p> <p>1.5 Have the applicable governmental, local authorities design codes/norms/rules/standards and design guides been listed in the PPEM and are they available in the discipline group?</p> <p>1.6 Have Company/client, standards/norms/guides/practices/procedures/ forms and specifications, applicable and to be used by your discipline, been listed in the PPEM and are they available in your group? (e.g. guideline for the preparation of EFD's)</p> <p>1.7 Are specific project specifications and/or amendments applicable and to be used? What is the availability of these specifications within the Systems Engineering group?</p> <p>1.8 Does the PPEM contain an instruction how to handle project variations of the original scope of work regarding administration, approvals and distribution prior to be implemented?</p> <p>1.9 Are client or Company symbols to be used for Engineering Flow Diagrams, and are they</p>								
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ISSUE	SHEET	DOC.NO.						
	1 of 8							

Checklist	Remarks	Action (X)
available?		
1.10 Does the PPEM state what kind of electronic files need to be delivered to the client?		
1.11 Does the PPEM state how EFD's generated by a supplier should be handled with respect to consistency in symbology and the use of CAD system?		
2. Underlying Documents, Activities		
2.1 ☒ Are safeguarding memoranda, safeguarding narratives and safeguarding flow schemes available within the group?		
2.2 ☒ Has systems engineering been involved in any formal reviews of the safeguarding documents?		
2.3 ☒ Has a proper safety review or HAZOP been conducted?		
2.4 To what extent was systems engineering involved?		
2.5 Have the findings been minuted?		
2.6 How has been assured that all findings have been properly implemented?		
2.7 ☒ Has the control philosophy been agreed with the client?		
2.8 Has Systems Engineering been involved in basic process design?		
2.9 What is the status of the process flow diagrams?		
2.10 Are process data sheets available and what is the status?		
2.11 ☒ Are the start-up and shut-down requirements available? In what form?		
2.12 ☒ Are the maintenance requirements, drainage and blowdown philosophies available?		
RB28011.doc	www.red-bag.com	ISSUE SHEET 2 of 8 DOC.NO.

Checklist	Remarks	Action (X)			
<p>In what form?</p>					
<p>2.13 ⊗ Is a pressure/temperature profile available with relief valve requirements?</p>					
<p>2.14 ⊗ How are PTP design data incorporated in the linetable (by the process, project or systems engineer, automatic via a process database etc.)?</p>					
<p>2.15 What is the basis for selection of pipe materials?</p>					
<p>2.16 Are requisitions of Company designed equipment available (towers, vessels and shell and tube heat exchangers)?</p> <p>Have these been released for purchase or bids (EFD issue "certified for detail design" only)?</p>					
<p>2.17 Are supplier EFD's for e.g. package units available?</p>					
<p>2.18 Is the scope of supplier supply in line with these EFD's?</p>					
<p>2.19 How is consistency guaranteed between supplier and Company EFD's?</p>					
<p>2.20 Are the C1 and C2 Specifications available?</p>					
<p>2.21 Are the insulation and tracing requirements available?</p>					
<p>2.22 Are the pressure testing and NDE testing to be listed in the linetable? If so, are the criteria available?</p>					
<p>3. Procedures (Administrative)</p>					
<p>3.1 How is it ensured that documents prepared by other disciplines or the selected suppliers are provided for info and/or comments?</p>					
<p>3.2 What standard has been used to organize a retrievable filing system?</p>					
<p>3.3 Are checkprints and masterprints of documents available?</p>					
<p>RB28011.doc</p>	<p>www.red-bag.com</p>	<table border="1"> <tr> <td data-bbox="951 1948 1024 2026">ISSUE</td> <td data-bbox="1024 1948 1164 2026">SHEET 3 of 8</td> <td data-bbox="1164 1948 1489 2026">DOC.NO.</td> </tr> </table>	ISSUE	SHEET 3 of 8	DOC.NO.
ISSUE	SHEET 3 of 8	DOC.NO.			

Checklist	Remarks	Action (X)			
<p>3.4 Are previous issues of documents kept with the discipline?</p> <p>If yes, is a special label being used?</p>					
<p>3.5 Does a technical specification exist in which the supplier is instructed how to develop the EFD's? Is this specification part of the requisition?</p>					
<p>3.6 To what extent are supplier EFD's handled any different from supplier furnished documents in general?</p>					
<p>3.7 How is the organization informed about EFD changes after "approved for design" issue?</p> <p>How are these changes indicated on the EFD's?</p>					
<p>3.8 Have P&ID's, been checked and/or approved by the Process LE prior to issue?</p>					
<p>3.9 Are the project master copies kept up-to-date with changes of the EFD's?</p>					
<p>3.10 Are the linetables reissued with every issue of the EFD's?</p>					
<p>4. Procedures (Technical)</p>					
<p>4.1 Are job related internal instructions used to execute the scope of work and service?</p> <p>Have all group members and other possible disciplines been provided with a copy?</p>					
<p>4.2 Which checklist or procedure is used to ensure completeness of the EFD's?</p>					
<p>4.3 To what level are linetable entries subdivided (pipe class, tracing, size, insulation)?</p>					
<p>5. Document Maintenance</p>					
<p>5.1 Is the number of "holds" on the EFD's, issue "certified for detail design", limited to the bare minimum and have the holds been qualified?</p>					
<p>5.2 Are the project master copies of EFD's kept up-to-date with process, instrumentation and</p>					
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ISSUE	SHEET 4 of 8	DOC.NO.			

Checklist	Remarks	Action (X)			
<p>5.3 piping changes on a continuous basis or with frequent intervals? How is this achieved?</p>					
<p>5.3 How is the status of checks of supplier drawings against Company engineering documents and their (re) issues documented?</p>					
<p>5.4 Are copies of EFD's routed for input and/or comments from other disciplines?</p> <p>At what stage(s)?</p>					
<p>5.5 What is the frequency of EFD re-issues?</p> <p>When was the last re-issue?</p>					
<p>5.6 How were EFD reviews organized, multi-discipline meetings or discipline by discipline?</p> <p>At which milestones?</p>					
<p>6. Job Control</p>					
<p>6.1 Has the budget for the systems engineering group been defined and where?</p>					
<p>6.2 Did the lead systems engineer prepare or accept the manhour estimate, planning and manpower curve in executing his scope of work?</p>					
<p>6.3 Does a level IV schedule exist for the EFD's/UFD's, linetable, PTP's?</p>					
<p>6.4 How is ensured that EFD's/UFD's are produced in sequence of criticality?</p>					
<p>6.5 What is the relationship between planned and actual document issue dates?</p>					
<p>6.6 Has the Project Execution Control System (PEC) been prepared for the scope of work and services required and is it used for progress measurement?</p>					
<p>6.7 Did the lead systems engineer specify the allocation of progress percentage for each step?</p>					
<p>6.8 How much is the progress measured against the PEC summary for the systems</p>					
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ISSUE	SHEET 5 of 8	DOC.NO.			

Checklist	Remarks	Action (X)			
<p>engineering group?</p> <p>State date.</p> <p>6.9 What is the efficiency reported in PEC?</p> <p>6.10 Have the PEC and scheduled manhours been adjusted based on the approved project variations?</p> <p>6.11 How does the final expected manhours requirement relate to the assigned manhour budget?</p> <p>6.12 Were any manpower problems experienced in:</p> <ul style="list-style-type: none"> • obtaining the right number of people? • obtaining the right quality of people? • performance of people? • attrition? <p>6.13 Are changes in the scope of work being processed in time?</p> <p>6.14 Does the lead systems engineer receive a copy of the weekly LDS print-out?</p> <p>6.15 Is there a regular coordination meeting with the project/ engineering management and other lead engineers, including planning and cost control?</p> <p>6.16 Is Systems Engineering represented separately or as part of the process Group?</p> <p>6.17 Is there evidence of good communication with other disciplines/ departments?</p> <p>6.18 To what extent and by whom are the planning, cost and engineering managers informed when changes and/or slippages are encountered?</p> <p>6.19 What is currently the percentage of agency personnel on the job within the systems engineering group?</p> <p>7. Additional Questions</p>					
RB28011.doc	www.red-bag.com	<table border="1"> <tr> <td data-bbox="950 1948 1023 2026">ISSUE</td> <td data-bbox="1023 1948 1162 2026">SHEET 6 of 8</td> <td data-bbox="1162 1948 1497 2026">DOC.NO.</td> </tr> </table>	ISSUE	SHEET 6 of 8	DOC.NO.
ISSUE	SHEET 6 of 8	DOC.NO.			

Product Audit Checklist

Note:

Any major deviation from requirements shall be tagged in the 'No' column and be elaborated on in the main report under Product Audit Findings.

Documents reviewed:

Questions	YES	NO	NA
1. Are input data available?			
1. Have they been formally issued?			
1. Have the data been qualified? (what is/is not included)			
1. Have they been screened for completeness?			
1. Have calculations been performed?			
1. Have these calculations been checked?			
1. Has the product been formally checked?			
1. Is checking evidence available?			
1. Do the issued documents contain sufficient information?			
1. Have multi-discipline input/comments been obtained?			
1. Are the issued documents checked for compliance with client, licensor and authority specifications?			
1. Have all deviations from client, licensor and authority specifications been discussed and formally agreed upon with the relevant party?			
1. Are supplier data included in the document?			
1. Have supplier data been qualified?			
1. Have all requirements of the document been covered?			
1. Have the document requirements been discussed with the internal client?			
1. Have the document requirements been discussed with the external client?			
1. Have any comments been received on earlier issues of the document?			
1. Have all comments been incorporated in later issues?			
1. If not, has agreement been reached about the implementation of comments?			
1. Have changes been clearly indicated?			
1. Has the PM or EM been involved in this discussion in case of comments from the client?			
1. Has the document been reviewed by the discipline manager or his delegate, if required?			
1. Has the document been formally approved at the proper authorization level?			

