MasterClass Series
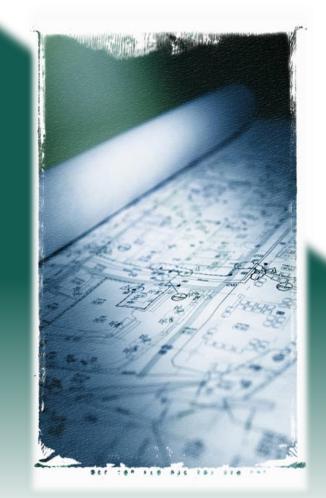
Systems Completion and CSU with API RP 1FSC

Course Outline

[Company], [Project],
[Location]
[Country]
[Month Year]

FALCON GLOBAL

Training Provider: Falcon Global Ltd and Global Falcon Americas, Inc
Course Title: Foundation Training in Systems Completion and CSU with API RP 1FSC
Instruction: Classroom
Instructors: Alan Mills and Felix Paul

Course Description:

This is an intensive 24-hour training workshop usually run over 3[1] consecutive days, delivered by subject matter experts, highly experienced in the methodology and practice of Systems Completion and Commissioning & Start-Up (CSU), with API RP 1FSC.

The course is in alignment with API RP 1FSC Recommended Practice for Facilities Systems Completion Planning and Execution, 1st Edition, published in July 2013.

It is targeted at Managers, Engineers, Technicians and Operators, currently or soon to be, involved in Systems Completion and CSU. Operators, Designers and office-based engineers about to become involved in Systems Completion through CSU will gain valuable insight to design requirements imposed by this crucially important Discipline.

Learning Outcomes:

The overall learning objective is for course followers to become knowledgeable in Systems Completion and familiar with vital strategies for successful CSU of projects, on time and safely, embedded within the guidelines of API Recommended Practice, 1 FSC 1st Edition.

The subject matter covered is contained in the training syllabus.

Learning Outcomes from each Module are:

Introduction

What is Commissioning? AND What is Systems Completion? AND API RP 1 FSC, 1st Edition AND Influence Curves: After completing this module, the student will be able to demonstrate an understanding of Systems Completion and Commissioning, with a visual representation, in terms the sequence of activities and methodology to be followed.

Phase 1 – Preparation

The Commissioning Manager: By completing this module, the student will understand the attributes of a Commissioning Manager, when he/she should be engaged, describe their duties and responsibilities and define the type of chart used for this purpose.

Scope Definition and Contract Requirements AND Certifying Authority & Regulatory Requirements: After this module, the student will be able to show an understanding of the Project's certification structure and its relationship with the regulatory framework.

---

[1] For students that do not have English as their first language, the course can be run over 4 or 5 days.

Handover / Turnover Procedures to Final Acceptance AND API RP 1FSC, 1st Edition, Annex A AND Develop a Completions Pyramid: At the conclusion of the module the student will show understanding of the contents of API RP 1FSC, create a visual representation of the Systems Completion process, produce the structure of a Turnover Completion Package and be able to demonstrate the need for agreement with Operations to determine Handover requirements.

Design Reviews AND Hazard & Operability Study and Risk Analysis AND Make Lessons Learned become Best Practices: After this module, the student can demonstrate knowledge of when Design Reviews are carried, by whom, when and why, articulate the need for Commissioning to actively participate in HAZOP Studies, explain how to conduct a "Lessons Learned" program and describe how to create Best Practices.

The Commissioning Plan AND Developing a Budget, Allowing for Growth: By completing this module the student will show understanding of the contents of API RP 1FSC, with respect to the need for planning, reproduce the structure of a typical Commissioning Plan, restate the activities to evaluate & select a SCDB, explain when a Commissioning budget should be created and state budgetary parameters in terms of project size and identify factors affecting performance. The student will also be able to demonstrate knowledge of estimating norms, know where these are obtained, how they are applied and what the limitations are.

Systemization AND Systems Completion Methodology: On completing this module the student will be able to identify the key Stakeholders and participants in the Systemization exercise, explain how battery limits are defined, provide a definition of a viable Sub System, articulate the contents of a Turnover Completion Package and identify the recipient.

Commissioning Team Organization, Recruitment and Training AND Auditing and Gap Analysis AND Define Reporting Requirements AND Develop Standard Operating Procedures AND Commissioning Procedures: By completing the activities in this module, the student will be able to differentiate the roles and composition of the Commissioning Team, articulate their responsibilities and reproduce a typical organization chart for the Commissioning Team. The student will also be able to explain when to do Audits, what a Gap Analysis is, what is being looked for and the outcomes. From there, the student will identify the range of reports needed to satisfy Commissioning and Project Management requirements. The student will be able to state the contents of a well-structured Commissioning Procedure and recall recommended steps in the development of Standard Operating Procedures.

Commissioning Spares AND Specialist Services, Helium & Nitrogen Leak Detection, Compressor Testing, Load Banks and Full Load String Testing AND Specific Offshore and Subsea Issues, FPSOs, Turrets AND Offices, Logistics, Equipment, Chemicals and Consumables: After completing this module, the student will know: the importance of Commissioning Spares, how to quantify and when to procure the items; the type of specialist services required for Commissioning and when these are required; how to quantify specialist services required for Commissioning on a Project; how to assess the comparative strengths and weaknesses of Leak Detection methods; the pros and cons of onshore testing versus offshore testing; the purpose of Compressor Testing, String Testing and the use of Load Banks; specific issues related to working Offshore and Subsea; the considerations of scope, schedule and budget for Offices, Logistics, Equipment, Chemicals and Consumables;

Phase 2 – Implementation

Commissioning Guidelines: On completing this module, the student will appreciate the need for clear, well-written Commissioning Guidelines.

Factory Acceptance Testing and Site Acceptance Testing: After this module, the student will have a clear understanding of the need for acceptance testing, whether at the vendor facility in the case of a Factory Acceptance Test (FAT), or a Site Acceptance Test (SAT) on arrival at the final destination. The student will also gain an appreciation of the risk-based approach to determine the selection of equipment for FAT and SAT. Additionally, the importance of knowing what equipment has (or is due to) undergo FAT / SAT will be emphasized and techniques for mitigating impact to the project schedule.

Preservations: At the conclusion of this module the student will have learned the fundamental principles of the need for Preservation and the risks if this importance is not put into practice.

Cleaning and Drying Procedures: After completing this module, the student will have learned about Cleaning and Drying techniques, evaluate where these should be deployed and be able to make a comparison of respective strengths and weaknesses.

Checksheet Types AND Gap Analysis – Which Checksheets to Use AND Tag Type Matrix, aka Allocation Matrix AND Gap Analysis – Which Certificates to Use AND Maintainable Items, Production Critical and Safety Critical Tagged Items AND Punch Listing and Types of Punch List Items (PLIs):   After this module, the student will have learned the types of Checksheet (ITR) used and the relevant part of API RP 1 FSC, the dependent relationship and hierarchy of certain Checksheets, how to define Tag Types, what a Tag Type Matrix is, how to create one for a project, and how to choose the correct Checksheets for the project. The student will understand that a Gap Analysis is needed to determine which Tag Types do not have Checksheets and how to go about filling the gaps by creating them.

The student will have learned the types of Certificate and Notice used, the dependent relationship and hierarchy of Certificate, the need to understand the Contract requirements, incorporate any Contract Exhibits in Zenator (SCDB) and how to choose the correct Certificates for the project. The student will understand that a Gap Analysis is needed to determine which Certificates are needed and how to go about filling the gaps by creating them.

The student will know the distinction between Commissionable and Non-Commissionable Tags and be aware of the two categories Commissionable Tags come under; Maintainable and Non-Maintainable. The student will be aware that Maintainable Tags can be further distinguished as Production Critical or Safety Critical, be aware of the Tag Types in these categories, know how these are treated differently and why.

The student will know the purpose of Punch Listing, the priority treatment of PLI Categories to achieve System Completion, how PLIs are recorded, treated, reported and cleared, and techniques for managing these processes.

Leak Detection: After completing this module, the student will know when in the sequence of commissioning activities leak detection takes place; the purpose and considerations of service testing with water, leak detection methods and precautionary checks.

Hot Oil Flushing of Hydraulic Systems / Lube Oil Systems: After completing this module, the student will be know the purpose of flushing hydraulic systems with hot oil, the systems typically designated and why, an overview of the cleanliness standards required and the considerations for performing these tests.

Pre-Start Up Safety Review (PSSR) HAZOP AND Lessons Learned: After completing this module, the student will have an understanding that the Pre-Start-Up Safety Review originates in the OSHA regulations concerning

process safety with the sequence of activities leading to a successful PSSR that should ensure a safe Start Up of the facility.

Turnover Completion Packages aka Commissioning Dossiers or Workpacks AND Handover to Operations:
On completing this module, the student will again be reminded of the importance of following the recommendations in this course to have excellent relations with Operations and be able to make timely contributions to the PSM and PSSR, achieved by delivering on the well thought through agreements made with Operations during Step 4 of the Simplified Commissioning Logic, while the project was early in Detailed Engineering. These concern the timing of TCCC around agreed battery limits and contents of TCPs.

Phase 3 – Close Out

Pre-Introduction of Process Media and Hazardous Chemicals HAZOP AND Completion of Commissioning Documentation AND Recording "As Built" or "As Commissioned" AND Certifying Authority and Regulatory Requirements AND Operator Training and Competency Assessment AND Lessons Learned AND Assisting Operations, Troubleshooting and Debottlenecking AND Close Out HAZOP 6 AND Demobilize Commissioning Team: On completing this module, the student will understand the need to professionally finish the project and make the final Handover to Operations in good order. Activities the Commissioning Team will be engaged in at this time are completing all Commissioning documentation "As Commissioned", contributing to "Lessons Learned" and determining "Best Practices", conducting a final HAZOP, updated with any changes since the previous HAZOP and negotiating with Operations to execute the Final Acceptance Certificate and Notice. Additionally, the student will know the role the Commissioning Team are likely to play in training personnel from Operations and assisting them to become familiar with the facilities, assisting with debottlenecking studies and planning the first shutdown.

Required Reading:

- Course materials including videos and embedded notes
- API Recommended Practice, 1 FSC 1st Edition

Assignments and Method of Evaluation:

- Course tutorials
- Competency Assessment Test

Certification:

- On successful completion of the course, each student is awarded a Certificate of Achievement and Continuing Professional Development signed and dated by the Instructor, acknowledging the training course location, start and finish dates and the number of Professional Development Hours (CPD, PDH).

Topics Covered / Daily Course Schedule:

Refer to the training syllabus