

WORKFACE PLANNING SCORECARD FOR CONSTRUCTION PHASE

PURPOSE

To verify the degree to which a project uses Workface Planning as recommended by the Construction Owners Association of Alberta.

STANDARD PRACTICE

Overview

- The goal of Workface Planning is to improve performance by getting the right things to the right place at the right time.
 - The Project must be planned forward from Engineering to Start-up since process systems drive commissioning and start-up, commissioning and start-up drive construction and construction drives engineering and procurement.
 - The planning process must work backward from Startup to Engineering to schedule the release of engineering to the field since the Path of Construction will drive the prioritized release of Construction Work Packages (CWP).
 - The prioritized release of CWP will determine the order in which the Field Installation Work Packages (FIWP) must be prepared and released to drive the sequence in which engineering and procurement is delivered to the field.
- The Workface Planning Scorecard can be completed at the project, discipline or contractor level. Lower scores indicate the degree of deviation from the model and identify opportunities to improve the planning effort.
- Attachment A contains the rules established by the COAA to help facilitate and enable the execution of workface planning. Attachment B contains the Scorecard used to verify compliance to these rules by assessing the response in five critical areas:
 - Field Installation Work Packages (FIWP) - is the concept used?
 - Planners - how effectively are dedicated planners used?
 - Construction Work Packages (CWP) - how is the project workscope controlled?
 - Field Installation Work Packages (FIWP) - how is the CWP broken down into work packages?
 - Integration and Coordination of FIWP - how are the FIWP integrated into a master schedule for effective overall coordination?

WORKFACE PLANNING SCORECARD FOR CONSTRUCTION PHASE

- The Workface Scorecard can be completed at any phase of the project or as many times as warranted. COAA suggests the project team conduct a workface planning audit at least six times during the project:
 1. At the end of the DBM (or FEL2) phase to confirm that workface planning principles have been incorporated into the execution strategy
 2. At the end of the FEED (or EDS or FEL3 or at project AFE) phase to confirm that the Project Execution Plan will support the strategy and required resources for the implementation of Workface Planning.
 3. At the middle of detailed engineering to verify that the Project Execution Plan developed during the FEED phase that supports Workface Planning is being implemented
 4. Before Construction mobilization to establish a baseline score ,
 5. Middle of Construction Phase to assess progress made in implementing workface planning and take corrective action where appropriate,
 6. End of Construction Phase to do an “As Built” and identify learned opportunities for improvement in workface planning process.

WORKFACE PLANNING SCORECARD FOR CONSTRUCTION PHASE

– Attachment A - COAA WORKFACE PLANNING RULES

Rule #1: Appoint dedicated Workface planner(s) to plan the work necessary for creating Field Installation Work Packages (FIWP's) from Construction Work Packages (CWP's). Do not rely on Construction Field Supervision to plan the work.

What this means:

- Dedicated Workface planners, assigned specifically to do the FIWP planning, plan the work and pull together the FIWP. Construction Field Supervision review and approve the plan and FIWP before execution.
- Roles and responsibilities of the dedicated planners is documented for the project and is understood by all, including an inventory of skills and/or experience required by a dedicated planner.
- Dedicated Workface planners who are experienced enough to execute the work themselves are brought onto the project to develop detailed plans and FIWPs that are of such quality that they require, at most, minor revisions when Construction Supervision reviews them.

Does not mean:

- Leave the planning of FIWP to Construction Field Supervision who will be supervising the installation of the FIWP in the field. Note: This may work at the beginning of the project, but supervision quickly gets burdened with other responsibilities as the project ramps-up and no longer has enough time to do appropriate planning.
- Field Supervisors do not follow the plan and go back to the traditional way of doing things.

Rule #2: Construction Contractor and/or Construction Management Team and Engineering Contractor jointly identify and develop respective Construction Work Package (CWP) and Engineering Work Package (EWP) identification and release plans which are reviewed and agreed upon by all parties. Approved release dates are entered into a Level 3 schedule prior to the start of detailed engineering.

What this means:

- Engineering firms develop an EWP identification and release plan that will support the path of construction and the development of CWPs by the constructor.
- Construction Contractor and/or Construction Management Team approve the EWP and CWP release plan based on the path of construction.
- Constructor and/or Construction Management Team develop the CWP's with input from the Engineering Contractor.
- Where Engineering has difficulty in accommodating the CWP plan, the Constructor, Construction Management Team, Engineering and Owner will decide upon the best balanced solution for the benefit of the project.

WORKFACE PLANNING SCORECARD FOR CONSTRUCTION PHASE

- It is critical that the scope of the CWPs is structured correctly so that the dedicated planners can separate the package into FIWPs efficiently and effectively.
- It is critical that the EWP/CWPs are issued on-time and in the correct sequence that suits the path of construction so the dedicated planner has the information required to assemble the FIWPs and enough time to develop a good plan.
- Experienced construction personnel work with engineering to determine CWP issue dates (preferably the construction superintendents that will execute construction).
- Experienced construction personnel monitor and expedite the CWP plan.

Does not mean:

- Engineering decides on the scope and sequence of the CWP with the schedulers only with no input from Construction.
- CWP issued incomplete just to meet schedule.

Rule #3: Develop an FIWP release plan based on the non-IFCed (Issued for Construction) CWP.

What this means:

- The number and type of packages are determined based on the planned FIWP size and type
- The FIWP release plan is a planning tool use to determine:
 - crew loadings,
 - size the Workface Planning group,
 - required templates.

Does not mean:

- The production FIWPs are built from non-IFCed CWPs (drawings)
- The packages are detailed; rather, these are shells or placeholders used only to identify number and type of FIWP

Rule #4: The FIWP should be completed at least 4 weeks before construction starts on that FIWP.

What this means:

- FIWP can be added to 3 week look-ahead and all will know that this work will be ready to proceed.
- FIWP scope can be completed and FIWP can be closed within 4 weeks by crew

Does not mean:

- Hand-to-mouth, engineering to construction.
- Releasing FIWP too early (e.g., releasing FIWP before it has been signed-off as ready per Rule #7)

WORKFACE PLANNING SCORECARD FOR CONSTRUCTION PHASE

Rule #5: Set-up work processes to ensure dedicated Workface Planners have access to the latest relevant project information required for preparation of FIWP and the intent of the information is understood by the dedicated planners.

What this means:

- Dedicated Workface Planners are given distribution list of relevant deliverables early in the project for review and comment.
- Workface Planners are provided the latest revisions of documents.
- If documents need to be revised after they have been issued for construction, Engineering notifies the Workface Planners.
- Project procedures describe the content level of the FIWPs, including a template
- Meetings are scheduled between Engineering and Workface Planners to discuss intent of CWP and any other relevant information.

Does not mean:

- Engineering “throws packages over the fence” to dedicated planners with no explanation of what the designer had in mind when it was designed.

Rule #6: Assign responsibility for integration planning to resolve anticipated conflicts proactively between FIWP.

What this means:

- Construction Management is responsible and accountable for the overall plan; however responsibility for ensuring that all FIWPs are coordinated and integrated is assigned to a designated Workface Planner.
- A General Superintendent (or Area Superintendent), Integration Planner or Workface Planner assigned responsibility for integration planning is onboard at first receipt of CWP and directs best packaging and timing of FIWP release to prevent contractors from stepping on each others toes (e.g. interference from x-ray, availability or interference from cranes or equipment, congestion issues). Integrated planner understands each FIWP well enough to understand where conflicts may arise or where opportunities exist for better cooperation. Note: If using a General Superintendent to do the integration planning, ensure this responsibility is documented and understood.
- Construction supervision may need to resolve unanticipated conflicts and review and approve overall integrated plan.

Does not mean:

- The FIWPs as produced are carried out without Construction Management performing a final feasibility check of the implementation time and constructability.

Rule #7: Assign responsibility for Material, Construction Equipment, Scaffold and Specialty Tool Coordination to dedicated Coordinator(s).

What this means:

WORKFACE PLANNING SCORECARD FOR CONSTRUCTION PHASE

- Assign dedicated coordinators to materials, equipment, scaffolding and specialty tools to ensure accountability of these items in an FIWP before it is released to the Foreman. Note: For mega projects assign Material Coordinators, Equipment Coordinators, Scaffolding Coordinators and Tool Coordinators that are accountable for this.
- General purpose tools are coordinated by the foreman.

Does not mean:

- Construction Field Supervision spends time chasing materials, equipment and/or tools.
- Construction Field Supervision are the dedicated coordinators.

Rule #8: Dedicated Workface Planner completes FIWP and has all relevant parties sign-off as ready before FIWP is released to crew.

What this means:

- Everything required for a construction crew to start and complete construction of a FIWP is in place before construction starts.

Does not mean:

- A FIWP is released with extensive workarounds and/or missing material, equipment or tools.
- The parties need to sign-off if they are not involved in that package, e.g., heavy lift would not need to sign-off if the package does not require lifting devices.

Rule #9: Track progress of each FIWP and provide targets to crew to drive performance.

What this means:

- Communicate progress to the crew.
- Decide ahead of preparing the FIWPs the level of tracking desired and adapt the Project Controls tools to accommodate that level of tracking. e.g., Quantity based production reports at a crew level are produced at a minimum. Include this requirement in the Project Execution Plan.
- Provide a coordination process that facilitates the planners, coordinators, construction supervisors and senior construction management to develop / integrate FIWP, graphically display the schedule for updates to progress and make timely decisions to resolve conflicts (e.g. a “war room” that houses all information required for completion of FIWP and a wall chart that tracks sign-offs required for each FIWP (e.g. ready for hydro, hydro sign-off, etc.), 3-D CAD measurement system, etc.).
- Targets are a challenge but achievable.
- Targets are visible and actual performance is also visible.

Does not mean:

- Targets are unachievable.

WORKFACE PLANNING SCORECARD FOR CONSTRUCTION PHASE

Rule #10: Dedicated Workface Planners to develop a backlog of FIWPs that can be issued to the crew by construction supervision if the crew can not complete the first issued FIWP due to unforeseen circumstances.

What this means:

- Plan B for surprises (e.g. weather, Quality issue discovered, etc.)

Does not mean:

- First FIWP can be poorly planned because there is a Plan B.

Rule #11: Write the requirement for Workface Planning into all engineering and construction contracts including roles and responsibilities of both Contractors and Owners. Owners must declare their commitment to Workface Planning and the required resourcing.

What this means:

- Owner needs to include Workface Planning as an expectation in contracts with any contractor involved in managing engineering and/or construction. Construction Managers need to include Workface Planning as an expectation in any construction contracts between the Construction Manager and the construction contractor.
- The Owner re-emphasizes the importance of Workface Planning and the Owners expectations for Workface Planning across all construction organizations on the project.
- The Owner must fully support additional indirect costs as a result of staffing the project with dedicated planners (approximately 1 for every 50 craft), in order to reap the benefit of an estimated 25% productivity improvement.

Does not mean:

- It is written into the contracts and then forgotten about.

Rule #12: Initiate and coordinate management audit to ensure that the above rules are being followed.

What this means:

- What gets measured gets done.
- Can combine audit with other stage-gating reviews.

Does not mean:

- Workface Planning runs itself.

WORKFACE PLANNING SCORECARD FOR CONSTRUCTION PHASE

Attachment B - COAA WORKFACE PLANNING SCORECARD

PROJECT DEMOGRAPHICS

Total Project Description: _____

Type of Facility, e.g. Mining, in situ: _____

Areas covered by Assessment, e.g. discipline, CWP: _____

Owner: _____ Location: _____

Project Budget: _____ Field Peak Manpower: _____

Construction Start Date: _____ Project Completion Date: _____

Prime Contractors: _____

Audit Date: _____

Auditors: _____

Instructions

1. With regard to project demographics please ensure you provide a detailed description of the project and where the audit relates to a part of the overall project. Collect data on each level (e.g.#1 Project budget \$8 billion, Area 3 budget \$500 million, Area 3 electrical budget \$25 million e.g.#2 Project field peak manpower 6,000, Area 3 field peak manpower 2,000, Area 3 electrical field peak manpower 250. e.g. #3 Project construction start date January 31 2007, Area 3 construction start date June 31, 2007, Area 3 electrical start date September 15, 2007).
2. Review the information on Workface Planning by accessing the COAA web site - <http://www.coaa.ab.ca/library.asp> to get a basic understanding of the Workface Planning Model and the best practices identified in the 11 rules defined by COAA in Attachment A
3. Score each of the thirty questions using the following criteria:
 - Strongly Disagree - the identified practice is not followed on this project.
 - Disagree - we often fail to meet the requirement as defined by the practice on this project.
 - Neutral - we follow the defined practice but inconsistently or consistently but not all the time
 - Agree - we follow the defined practice consistently and meet the requirement most of the time.
 - Strongly Agree - we follow the defined practice all the time.
- 4 There are typically variations within and between contractors so a simple yes or no response is not sufficient and the auditor should qualify the response based

WORKFACE PLANNING SCORECARD FOR CONSTRUCTION PHASE

on the type of project, degree of detail required to manage the work, how work is introduced in the field and who does the planning. If the defined practice is not followed, explain why not and how you manage the item described in your organization.

- 5 For each of the 5 areas identified in the scorecard, sum the score and carry forward to the scorecard summary sheet
- 6 a) The fundamentals for successful implementation of workface planning is in scoring well on questions 1.1a, 1.4, 2.1, 3.1, 5.1, 5.2, and 5.3. Therefore to qualify for a gold, silver or bronze designation a minimum score of 4 on each of these questions is required. In order for a contractor or project to be designated as gold, silver, or bronze by COAA an independent review must be conducted to verify the results of the self assessment by a COAA approved reviewer.

b) If condition a) is met then Gold is awarded for an average score of 120 or greater, silver is awarded for an average score of 105 to 119 and bronze is awarded for an average score of 90 to 104.

Scorecard Summary

Field Installation Work Package:	Score: _____/70 = ____%
Planners:	Score: _____/25 = ____%
CWP Release Plan and Approvals:	Score: _____/10 = ____%
FIWP Release Plan and Approvals:	Score: _____/15 = ____%
Integration and Coordination of FIWP:	Score: _____/30 = ____%
Total Score:	_____ /150 = ____%

Project: _____		Score					Date: _____
Audit #	Description	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Comments / Observations
		1	2	3	4	5	
1.0	Field Installation Work Package						
1.1a	Work is packaged in Field Installation Work Packages (FIWP). - Clarification: An FIWP is a detailed scope of the work to be completed by a crew, over a specified period of time (normally a 1 to 2 week period).						
1.1b	FIWP's identify the work to be completed by the team c/w technical data, drawings and specifications. Clarification: The specifications and standards referenced in the FIWP are available at the construction office.						
1.1c	FIWP's identify the general sequence of the work and the labour necessary to complete the work Clarification: The planned job task steps and the actual crew allocation for planned activities is a foreman's responsibility.						
1.1d	FIWP's identify all required material necessary to complete the work. Clarification: The Bill of Material is segregated by FIWP.						

Project: _____		Score					Date: _____
Audit #	Description	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Comments / Observations
		1	2	3	4	5	
1.1e	FIWP's have a process for identifying all required specialty tools, scaffolding and construction equipment necessary to complete the work.						
1.1f	FIWP's identify relevant special conditions. Clarification: Examples of special conditions include: Elevated, Confined Space.						
1.1g	FIWP's include/or reference quality control and NDE requirements.						
1.1h	FIWP's include or reference major execution risk response plans. Clarification: The foreman is responsible at the beginning of each shift to prepare a detailed Field Level Risk or Safety Task Analysis, specific to the site conditions						
1.1i	FIWP's identify their interdependencies. Clarification: Interdependencies refer to other FIWP that could impact the completion of this FIWP, these could be from any discipline.						
1.2	There are adequate controls to ensure all resources required to complete the FIWP are identified at the end of the FEED phase and are available prior to construction mobilization and in place before FIWP release. Clarification: Release refers to issuance by						

Project: _____		Score					Date: _____
Audit #	Description	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Comments / Observations
		1	2	3	4	5	
	parties completing the FIWP. Parties could include engineering, procurement, construction, or commissioning.						
1.3	FIWP are assembled and issued at least 4 weeks prior to release of the work.						
1.4	A dedicated WorkFace Planner completes FIWP and signs-off before FIWP is released to crew. Clarification: An FIWP Checklist is discipline specific (civil, structural, piping, electrical, etc.) and itemizes all the information and documentation that should be part of the completed FIWP.						
1.5	There is a sufficient backlog of FIWP's that can be issued to replace scheduled FIWP delayed due to unforeseen circumstances						
1.6	The requirement for Workface Planning including the expectations of contractor / sub-contractor/ planner and owner role & responsibilities is written into all contracts and/or sub-contracts?						
	Section 1.0 Total (out of 70)						

2.0	Planners	
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Project: _____		Score					Date: _____
Audit #	Description	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Comments / Observations
		1	2	3	4	5	
2.1	WorkFace planner(s) develop the Field Installation Work Packages (FIWP)? Clarification: A dedicated planner spends virtually all of their time developing FIWP.						
2.2	WorkFace planners have the experience as described on the job description.						
2.3	WorkFace planners are on the distribution list for relevant project documentation or have access to the latest relevant information required for preparation of FIWP						
2.4	Work processes have been established to ensure planners have access to the latest relevant information						
2.5	The information provided to the WorkFace planner is clear and complete						
Section 2.0 Total (out of 25)							

3.0	EWP/CWP Release Plan and Approvals	
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Project: _____

Score

Date: _____

Audit #	Description	Score					Comments / Observations
		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	
		1	2	3	4	5	
3.1	<p>A schedule is developed, prior to the start of detailed engineering, for all Construction and Engineering Work Packages (EWP/CWP), required to maintain the agreed path of construction and the Engineering and Procurement sequence to support the construction plan?</p> <p>Clarification: The work breakdown structure for a specific design area consists of a series of Engineering and Construction Work Packages (EWP/CWP) by discipline and sub-area. The schedule for release of EWP/CWP is determined by the priority of the process systems and the required path of construction.</p>						
3.2	Experienced construction personnel approve the schedule, scope, sequence & timing of EWP/CWP?						
	Section 3.0 Total (out of 10)						

Project: _____

Score

Date: _____

Audit #	Description	Score					Comments / Observations
		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	
		1	2	3	4	5	
4.0	FIWP Release Plan and Approvals						
4.1	A schedule and release plan is developed, for all Field Installation Work Packages (FIWP) based on the CWP.						
4.2	General foremen, planners and construction superintendents review and agree to the schedule, scope, sequence and timing of the FIWP?						
4.3	Final approval by Construction superintendent or their designate of the schedule, scope, sequence & timing of the FIWP?						
	Section 4.0 Total (out of 15)						

Project: _____		Score					Date: _____
Audit #	Description	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Comments / Observations
		1	2	3	4	5	
5.0	Integration and Coordination of FIWP						
5.1	Responsibility for integration planning has been determined to resolve anticipated conflicts proactively between FIWP?						
5.2	Assign responsibility for material coordination of FIWP to dedicated Coordinator(s)?						
5.3	Assign responsibility for specialty tools and construction equipment coordination of FIWP to dedicated Coordinator(s)?						
5.4	<p>The tracking levels and coordination procedures are established for the planners, general foremen, construction superintendent and resource coordinators to drive the performance during the construction phase?</p> <p>Clarification: Consider the use of a war room meaning a space dedicated to the planning group that allows the planners, coordinators, construction supervisors, and senior construction management to graphically display the schedule for updates to progress status and make timely decisions to resolve conflicts.</p>						
5.5	<p>FIWP Status (progress and cost) is tracked in a visible way, including completion of FIWP against targets?</p> <p>Clarification: The project control tools are Capable to provide the Information on cost and Schedule for the agreed FIWP status tracking level</p>						

Project: _____

Score

Date: _____

Audit #	Description	Score					Comments / Observations
		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	
		1	2	3	4	5	
5.6	Adequate management audits undertaken to ensure that the above rules are being followed?						
	Section 5.0 Total (out of 30)						