

AWP - An Owner's Perspective

ExxonMobil – Jacobs

NAGrowth BOP Interconnects Project





Project Overview

Location: Baytown, TX

Project Type: Revamp Project

Contracting Strategy: Reimbursable Cost

Size: 2M Work Hours

Tie ins: 164 including 17 hot taps

Scheduled Outages: 6





Reasons For Using AWP:

- Front line supervision planning limitations
- Dealing with increased project complexity
- Addressing project completion delays
- Ensuring material availability and allocation



AWP is a system to:

Align E & P to support the C sequence:

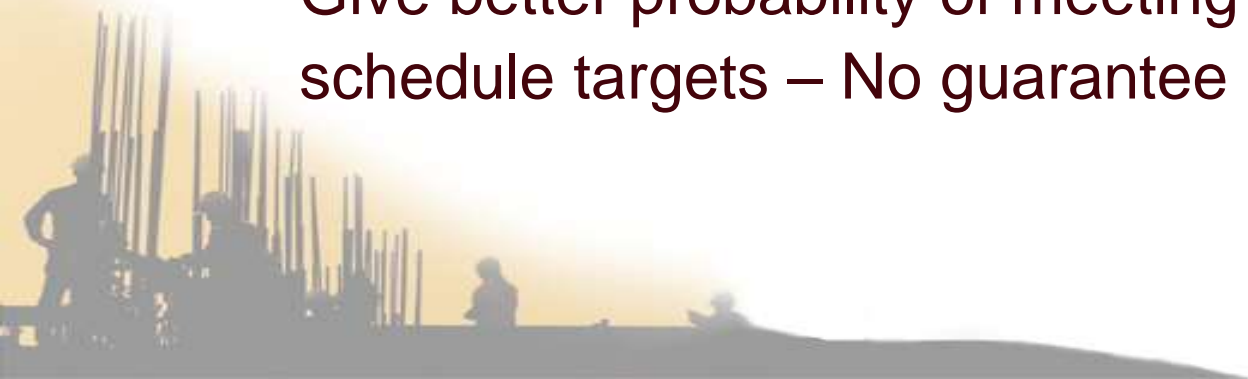
- Construction Work Areas (CWA)
- Construction Work Packages (CWP)
- Engineering Work Packages (EWP)
- Procurement Work Packages (PWP)
- Installation Work Packages (IWP)





AWP is a system to:

- Break construction into best execution sequence
- Package the work in a way that is readily understood by supervision, workers and materials management
- Give better probability of meeting cost and schedule targets – No guarantee



AWP Is Not:

- A guarantee of success
- An alternative to forward thinking and effort
- An “Easy Button”





Keys to Success:

- Partnership between owner and contractors
- Owner and Contractor PMs and CMs need to:
 - Be the AWP sponsors
 - Drive AWP from start to finish
 - Ensure that their people are trained and aligned
 - Do regular follow-up checks
 - Hold their people accountable to embrace and use



Keys to Success (cont.):

- Understand business drivers for owner and contractor:
 - Process system completion sequence and dates
 - Contractual drivers (Payment milestones, LD's, etc)
- AWP should be implemented during Front End Engineering Design (FEED)
- EWP and PWP sequence driven by construction



Keys to Success (cont.):

- Experienced construction people in engineering
- Associate key work package completions with contractor milestone payments (LS contracts)
- Disciplined use of system and sequencing





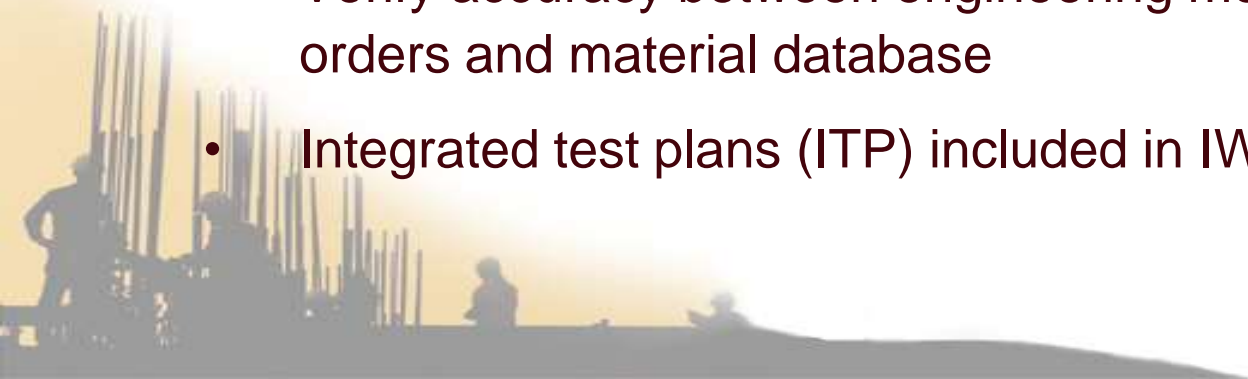
Keys to Success (cont.):

- Planner and craft superintendent alignment in defining IWP boundaries
- IWP development > 90 days before installation
- Do not start until materials support the work
- IWP stays on 3WLA schedule until QC signs off



Keys to Success (cont.):

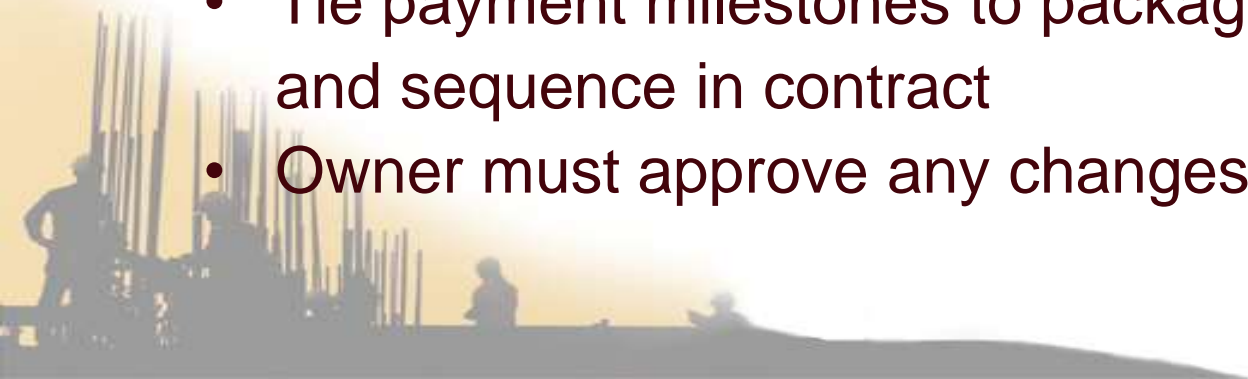
- Manual take offs (MTO) required to account for items not listed on drawings; shims, plates and rebar chairs, etc
- Tools need to be in place to address drawing revisions and associated material revisions
- Verify accuracy between engineering model, purchase orders and material database
- Integrated test plans (ITP) included in IWP > punch list



Alternative Case:

Separate LS for E+P and Construction

- Owner responsible for CWA and CWP structure and sequence strategy > In RFQs for E+P and C
- Negotiate pkg boundaries and sequence
- Tie payment milestones to package completions and sequence in contract
- Owner must approve any changes





What We Would Do Differently:

- Did not understand the significance of defining EWP's and PWP's based on construction before developing the engineering schedule
- Progress engineering by EWP completions, not ISO issues
- Progress procurement by PWP completions





Things To Be Aware Of:

- Just because a contractor has used AWP successfully on one project doesn't mean they can implement it across the board. Requires the right leadership, people and team – Use due diligence
- Have owner's team go to AWP training before interviewing contractors
- Believing AWP will improve productivity by 25%

Results:

- TRIR – 0.11
- Productivity 10% better than plan
- Intentionally delayed pipe installation by 3 months –
Recognized material delays via IWPs:
 - Avoided costs due to premature mobilization
 - Recovered schedule in 4 months due to productivity gains
- Supervision and craftsmen easily visualized work via model shots in IWPs

Results (Cont.):

- Final costs significantly below appropriation value due to 4 key factors:
 - Rigorous use of AWP by project team
 - Contractor team very cost conscious throughout project
 - Use of dance floor scaffolds vs multiple individual scaffolds
 - Delay in start of pipe due to material delays saved significant money
- Project completed on schedule