

# ANIMP

ASSOCIAZIONE NAZIONALE DI IMPIANTISTICA INDUSTRIALE

# AWP: Un nuovo approccio alla gestione ed esecuzione dei progetti

Webinar a cura di:

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Moderatore Sergio Sturaro – Componente del Comitato Direttivo della Sezione Construction

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# INTRODUZIONE

- ANIMP come ASSOCIAZIONE NAZIONALE di IMPIANTISTICA INDUSTRIALE è organizzata in 11 sezioni che racchiudono le imprese del settore iscritte
- La Sezione CONSTRUCTION, una delle prime ad essere formata, rappresenta, dal 1999, le aziende associate del settore delle costruzioni e ne promuove l'evoluzione
- L'obiettivo è rinnovare il patrimonio di competenze grazie all'ottimizzazione dei processi gestionali e produttivi, all'impiego delle tecnologie informatiche nella progettazione costruttiva, all'adozione di elevati standard di qualità e di sicurezza e alla minimizzazione dell'impatto ambientale
- La Sezione CONSTRUCTION propone attività di formazione e momenti d'incontro per diffondere il linguaggio della Costruzione e la conoscenza di strumenti all'avanguardia in termini di progettazione e di management dei progetti
- È in questa filosofia di pensiero che il webinar di oggi dedicato alla metodologia AWP si inserisce



## RELATORI



Luigi Anselmi Head of Construction Methods & Innovation Tecnimont



Antonio Schiavone AWP Group Leader Tecnimont



#### MODERATORE

#### Sergio Sturaro Componente del Comitato Direttivo della

Sezione Construction





## LET'S START... BUT FIRST

#### Some Webinar Rules

Please mute your microphones



Please turn off your camera



Please submit your questions in chat during this webinar or please raise your hand if you have any question



#### AGENDA

1. Introduction to Advanced Work Packaging (AWP) Methodology Luigi Anselmi ◄

2. Definitions Antonio Schiavone ◄»

- 3. Industrialization Luigi Anselmi ◄»
- 4. Application Examples Antonio Schiavone ◄
- 5. AWP & Digital Construction Luigi Anselmi ◄
- 6. Question&Aswer

## 1. Introduction to Advanced Work Packaging (AWP) Methodology





Construction Industry Institute (CII)\* defines AWP as follows:

«Advanced Work Packaging is the overall process flow of all the detailed work (Construction, Engineering and Installation work packages). AWP is a planned, executable process that encompasses the work on an EPC project, beginning with initial planning and continuing through detailed design and construction execution. AWP provides the framework for productive and progressive construction and presumes the existence of a construction execution plan».



\*CII, based at The University of Texas at Austin, is a consortiu These organizations have joined together to enhance the industry alliances. more than 140 leading owner, engineering-contractor, and supplier firms from both the public and private arenas less effectiveness and sustainability of the capital facility life cycle through CII research, related initiatives, and

#### AWP ESSENCE



AWP enables the breakdown of something complex into small, simple, manageable, planable, achievable and controllable pieces that can actually be led to their closure

#### AWP: DATA INTEGRATION ALONG PROJECT PHASES



One of the **main objectives** of AWP is the **creation of an integrated information management** system which allows the collection by package, engineering, procurement and construction information, thus creating the premises for the subsequent phase on field which is the workface preparation.



## 2. Definitions



### WORK PROCESSES: AWP MAJOR DEFINITIONS



| Object | Definition   | Volume (SMH)           |
|--------|--|------------------------|
| CWA    | A logical/physical division of work following the<br>priorities defined by Construction/Commissioning.<br>Normally the CWA, where it does not coincide with the<br>lowest PBS level, must be understood as a further<br>subdivision of the PBS, to satisfy the AWP<br>methodology.   | approx. <b>300'000</b> |
| CWP    | A CWP is a group or a single construction activity on<br>the Project Control Schedule (P6 level 3) with a logical<br>connection to EWP, PWP and CPG.<br>As a component of the WBS, each CWP represents<br>one activity in the Level 3 schedule, resides entirely<br>within a single CWA, and has a specific one to one<br>relationship with its' associated EWP and PWP. | up to <b>40'000</b>    |
| IWP    | Discrete portion of a single CWP, each IWP becomes a single level 4 schedule activity. In detail, a single discipline constraints free segment of work that is manageable by the construction superintendent in a time span of 10 working days.  | approx. <b>700</b>     |

#### **TECNIMONT AWP SYSTEM: ROLES & RESPONSIBILITIES**



| Project Director / Project Manager                | Foster and sponsor the implementation of AWP clearly communicating his/her commitment to the project team and supports the AWP Project Plan. Delegate authority to the AWP Champion.  |
|---|---|
| AWP Champion                                      | Be responsible of the implementation of the AWP Procedure implementation in all different<br>phases of the Project.<br>Facilitates the optimal development of Path of Construction and the follow-up of the<br>relevant Action list.<br>Ensures that information flow (EWP and PWP) is complete and up to date with the<br>involvement of Construction Subcontractor for the successful of AWP application at Site. |
| Project Engineering Manager                       | Defines EWP packages and related action items such as tagging procedure. Is responsible for incorporating AWP Project Plan action items into the Project Engineering Execution Plan.  |
| Project Procurement Manager                       | Be responsible for loading into the dedicated company software all information related to material status/delivery dates updating relevant PWP. Is responsible for incorporating AWP Project Plan action items into the Project Procurement Execution Plan.   |
| Plant Information Management (PIM)<br>Coordinator | Provides adequate supports to the Project Team to implmenet the PIM methodology.<br>Ensures the set up of the Project Tools and Databases hierarchy and ensure the related<br>start up and maintenance.   |

#### **TECNIMONT AWP SYSTEM: ROLES & RESPONSIBILITIES**



| Project Control Manager | Cooperates with AWP Champion during development of Path of Construction and definition<br>of the CWA.<br>Coordinates all Project Schedules incorporating actions from AWP Project Plan and the<br>scheduling of EWP, PWP, CWP into Project Control System with relevant progress<br>monitoring. |  |  |  |  |  |
|-------------------------|---|--|--|--|--|--|
| Site Manager            | Ensures that AWP is implemented at site monitoring its progress and ensuring the effective engagement of all parties at Site.   |  |  |  |  |  |
| Construction Manager    | Provides inputs to the definition of Path of Construction.<br>Ensure and guide the preparation and issuance of IWP at Site with the subsequent<br>execution by Construction Subcontractor.  |  |  |  |  |  |
| Work-Face Engineer      | Ensures the proper field workface preparation in coordination with AWP Champion,<br>Construction Manager and Field Supervisors. Supports Construction Subcontractors on the<br>workface preparation for defined IWP with relevant schedule and progress update.                                 |  |  |  |  |  |
| Commissioning Manager   | Ensures the definitions of the commissioning priorities making plant systemization data available and incorporated into management systems.<br>Provides inputs to the definition of Path of Construction toward System Completion.  |  |  |  |  |  |

## 3. Industrialization



#### **DRIVERS TO INDUSTRIALIZATION**







- Standardization of PROCESS and TERMINOLOGY
- CORPORATE PROCEDURE release
- AWP oriented to **INTEGRATE PROCESSES**
- **TAG** centric processes
- Instituting AWP DEDICATED ROLES
- Specific TRAINING session
- Dissemination of AWP CULTURE
- From Project silos to Project collaborative execution
- TECNIMONT'S AWP SYSTEM implementation
- AWP oriented to **INTEGRATED APPLICATIONS**
- Simple **KPI d**efined
- Prevent bottlenecks through advanced process
   mining techniques

WE KEEP OUR FOCUS HIGH ON INTERNAL AND EXERNAL AWP EVOLUTION





#### **TECNIMONT'S AWP SYSTEM AND DATA HUB**





An application model for a disciplined management of all EPC processes into a **single central data repository**.

Normalised data model and structured coding.

**Increased visibility** of Project **details** and **real-time shareability** of the **information** directly processed by process-proprietary systems and tools.

E-P-C data handled at same level with interchangeability of sequences and priorities oriented to Construction-driven execution.

#### AWP INDUSTRIALIZATION IN TECNIMONT: SYSTEMS



Tecnimont ANIMP

#### **AWP IMPLEMENTATION IN A CAPITAL PROJECT**



Tecnimont ANIMP





#### ... TO INTEGRATED PULLING SCHEDULE





#### **AWP: TECNIMONT APPLICATION MAP**







The Automation of Processes and the introduction of new Technologies enabled AWP Methodology and all Construction Digital solutions on Large and Small-size projects







Planning of the Start-Up Phases begins at early stage of the Project in HO. **AWP** is the **transition** piece from area-wise progress to **system-oriented** completion through **IWPs** and **SWPs** 



Definition of Systems and Sub-Systems **switching** construction schedule from Project Breakdown Structure (IWP area-wise) to Systems completions (SWP).



Implementation of the MC Database and tracking tool since the beginning of the Project:

- Non Process Static Systems NPS (foundations, steel structures, etc.)
- Non Process Dynamic Systems NPD (electrical substation and distribution, etc.)
- Process Dynamic Systems PDS (those from P&ID)
- Inspection and Tests Plans ITP and defined Quality Forms
- TAGs identifying each component subject to a control cycle

### AWP AS OF TODAY IN TECNIMONT



| PROJECT        | PROJECT TYPE       | CONTRACT TYPE               | COUNTRY    |
|----------------|--------------------|-----------------------------|------------|
| BCEP           | Petrochemical      | EPCm / Ongoing              | USA        |
| HAOR           | Oil & Gas Refining | EPC LSTK / Completed - 2022 | Azerbaijan |
| MERCURY        | Oil & Gas Refining | FEED / Completed - 2020     | Turkey     |
| ΜΟΤΙVΑ         | Petrochemical      | FEED / Completed – 2020     | USA        |
| VOLGAFERT      | Fertilizer         | EPC LSTK / Ongoing          | Russia     |
| KINGISEPP II   | Fertilizer         | JV-EPC LSTK / Ongoing       | Russia     |
| GEMLIK GUBRE   | Fertilizer         | EPC LSTK / Ongoing          | Turkey     |
| HAOR MEROX-GHT | Oil & Gas Refining | EPC LSTK / Ongoing          | Azerbaijan |
| APOC           | Petrochemical      | EPC LSTK / Ongoing          | KSA Same   |
| ALBA           | Petrochemical      | EPC LSTK / Ongoing          | Portugal 🔋 |
| COVESTRO       | Chemical           | EPC LSTK / Ongoing          | Belgium    |
| DUMAD          | Petrochemical      | EPC LSTK / Ongoing          | India 🔹    |
| PX PARADIP     | Petrochemical      | EPC LSTK / Ongoing          | India 🔹    |
| IOCL BARAUNI   | Petrochemical      | EPC LSTK / Ongoing          | India      |
| BOROUGE B4     | Petrochemical      | EPC LSTK / Ongoing          | UAE        |
| CLEAN AMMONIA  | Fertilizer         | EP / Ongoing                | USA        |

#### **TECNIMONT AWP SOLUTIONS AT A GLANCE**





## **4.** Application Examples



#### **CWA – CONSTRUCTION WORK AREAS – PO PLANT EXAMPLE**



Tecnimont ANIMP

#### **FROM 3D MODEL TO SINGLE IWP**







#### MAIN STATUS FROM CONTROL PANEL





#### WORKFRONTS PREDICTABILITY – INTERACTIVE SESSION











#### 4000 MTPD UREA MELT AND GRANULATION

#### AWP WORKING PROCESS INSTALLATION WORK PACKAGES (IWP)

 TCM JOB No
 : 4124

 TCM DOC. NUMBER
 : 2.2.7.90-EWSTR001-SCAIMA000-3

 Ref TCM DOC. NUMBER:
 4124-LZ-PC-200000600

 Ref TCM DOC. NUMBER:
 4124-LZ-DG-220000600



#### AWP AND IWP SAMPLE











AWP AND IWP SAMPLE CO2 COMPRESSOR HOUSE PIPING (IWP NO.662-10-CWXH02-3 & 4)





Tecnimont ANIMP

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#### AWP AND IWP SAMPLE TEST WORK PACKAGE - 1-(34-U-02)-CW46-WP1

|          |  | ISO list: |                  |              |            |          |   |                  |  |                   |                      |             |              |                                       |
|----------|--|-----------|------------------|--------------|------------|----------|---|------------------|--|-------------------|----------------------|-------------|--------------|---------------------------------------|
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|          |  | - AVAR    | WW .             | AND ALLA     |            |          |   |                  |  | 3410-CWR3406704-1 | TP-AG-34-U-02-01-001 | 32          | 24           | 100%                                  |
| D        | XXXXXXXXX  | AX73      | $\Delta \Lambda$ | MAR AN       |            | A Van    | XXXXXXXXXX                                | - 17 I           |  | 3410-CWR3406801-1 | TP-AG-34-U-02-01-001 | 43          | 25           | 100%                                  |
| $\sim$   |  | AN AN     | * / ARI          | VKI BOXA !!! |            |          | MANA ANA ANA                              | Starth And Same  |  | 3410-CWR3407501-1 | TP-AG-34-U-02-01-001 | 13          | 7            | 100%                                  |
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| Z)S      | No the Contraction of the Contra | 88/AV/    |                  | MAX AND IT   |            |          | XX//XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX    | VXX 21           |  | 3410-CWR3410705-1 | TP-AG-34-U-02-01-001 | 31          | 14           | 100%                                  |
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| 2        |  | XXX       | XXXX             | AA TA        |            | 日日日      | 1 torte                                   | 1                |  | 3410-CWR3412101-3 | TP-AG-34-U-02-01-001 | 50          | 60           | 100%                                  |
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|          | TP No.   | ISO q.ty  | Unit             | System No.   | Fluid Code | ТР Туре  |   |                  |  |                   | A                    |             |              |                                       |
|          | TP-AG-34-U-02-01-001   | 96        | 34               | 34-U-02      | CWR        | Hydro    | et p                                      |                  |  |                   | A r                  |             | · J          | ANIMP                                 |

## 5. AWP & Digital Construction



#### **AWP & DIGITAL CONSTRUCTION**







