

**COURSE OVERVIEW PE0101**  
**Certified Gas Plant Operator Program (CGO)**

**Course Title**

Certified Gas Plant Operator Program (CGO)

**Course Date/Venue**

May 04-08, 2025/Slaysel 02 Meeting Room,  
 Movenpick Hotel & Resort Al Bida'a Kuwait, City  
 of Kuwait

**Course Reference**

PE0101

**Course Duration/Credits**

Five days/3.0 CEUs/30 PDHs



**Course Description**



***This practical and highly-interactive course includes various practical sessions and exercises. Theory learnt will be applied using our state-of-the-art simulators.***



This course is designed to provide participants with a detailed and up-to-date overview of gas plant operation. It covers the proper knowledge and skills expected in a competent process operator including process operations, process equipment, process control, process instrumentation and modern troubleshooting techniques; the various types of separators, hydrates, gas dehydration, gas sweetening, condensate stabilization and fractionation; the liquefied petroleum gases and the operation, control and troubleshooting process of equipment including centrifugal pumps, positive displacement and vacuum pumps, centrifugal compressors, displacement compressors as well as fan and blowers; and the various types of valves and its applications, functions, operation, maintenance and troubleshooting.



During this interactive course, participants will learn the various measurement in process control such as pressure measurement, level measurement, temperature measurement and flow measurement and their corresponding principles; the principles of control valves including its body types, cavitation, valve coefficient and characteristics; the main types of actuators and accessories; the pressure relief valves and rupture discs including its types and functions; the proper application, operation, maintenance and troubleshooting; and the operation, control, maintenance and troubleshooting of storage tanks and its types, auxiliaries and internals, applications and constrains and functions.

## Course Objectives

Upon the successful completion of this course, each participant will be able to:-

- Get certified as a “*Certified Gas Plant Operator (CGO)*”
- Apply proper knowledge and skills expected in a competent process operator including process operations, process equipment, process control, process instrumentation and modern troubleshooting techniques
- Identify various types of separators and explain hydrates, gas dehydration as well as gas sweetening, condensate stabilization and fractionation
- Recognize liquefied petroleum gases and operate, control and troubleshoot process equipment including centrifugal pumps, positive displacement & vacuum pumps, centrifugal compressors, displacement compressors as well as fan and blowers
- Discuss the various types of valves and carryout its applications, functions, operation, maintenance and troubleshooting
- Distinguish the various measurement in process control such as pressure measurement, level measurement, temperature measurement and flow measurement and differentiate their corresponding principles
- Recognize the principles of control valves including its body types, cavitation, valve coefficient and characteristics and list the main types of actuators and accessories
- Explain pressure relief valves and rupture discs including its types and functions and employ its proper application, operation, maintenance and troubleshooting
- Operate, control, maintain and troubleshoot storage tanks and enumerate its types, auxiliaries and internals, applications and constrains as well as its functions

## Exclusive Smart Training Kit - H-STK®



*Participants of this course will receive the exclusive “Haward Smart Training Kit” (H-STK®). The H-STK® consists of a comprehensive set of technical content which includes **electronic version** of the course materials conveniently saved in a **Tablet PC**.*

## Who Should Attend

This course provides an overview of all significant aspects and considerations of gas plant operation for process operators and technical staff of all levels.

## Course Fee

**US\$ 5,500** per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

## Accommodation

Accommodation is not included in the course fees. However, any accommodation required can be arranged at the time of booking.

**Course Certificate(s)**

(1) Internationally recognized Competency Certificates and Plastic Wallet Card Certificates will be issued to participants who completed a minimum of 80% of the total tuition hours and successfully passed the exam at the end of the course. Successful candidate will be certified as a “*Certified Gas Plant Operator (CGO)*”. Certificates are valid for 5 years.

**Recertification is FOC for a Lifetime.**

**Sample of Certificates**

The following are samples of the certificates that will be awarded to course participants:-



- (2) Official Transcript of Records will be provided to the successful delegates with the equivalent number of ANSI/IACET accredited Continuing Education Units (CEUs) earned during the course

\* Haward Technology \* CEUs \* Haward Technology \* CEUs \* Haward Technology \* CEUs \* Haward Technology \*



**Haward Technology Middle East**

Continuing Professional Development (HTME-CPD)

**CEUs**

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### CEU Official Transcript of Records

**TOR Issuance Date:** 14-Nov-19

**HTME No.** 8667-2014-9020-2555

**Participant Name:** Abdulsatar Al Otaibi

| Program Ref. | Program Title                              | Program Date         | No. of Contact Hours | CEU's |
|--------------|--|----------------------|----------------------|-------|
| PE0101       | Certified Gas Plant Operator Program (CGO) | November 10-14, 2019 | 30                   | 3.0   |

Total No. of CEU's Earned as of TOR Issuance Date **3.0**

**TRUE COPY**



**Maricel De Guzman**  
Academic Director

Haward Technology has been approved as an Authorized Provider by the International Association for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Herndon, VA 20171, USA. In obtaining this approval, Haward Technology has demonstrated that it complies with the ANSI/IACET 1-2013 Standard which is widely recognized as the standard of good practice internationally. As a result of their Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for programs that qualify under the ANSI/IACET 1-2013 Standard.

Haward Technology's courses meet the professional certification and continuing education requirements for participants seeking Continuing Education Units (CEUs) in accordance with the rules & regulations of the International Association for Continuing Education & Training (IACET). IACET is an international authority that evaluates programs according to strict, research-based criteria and guidelines. The CEU is an internationally accepted uniform unit of measurement in qualified courses of continuing education.

Haward Technology is accredited by










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\* Haward Technology \* CEUs \* Haward Technology \* CEUs \* Haward Technology \* CEUs \* Haward Technology \*

## Certificate Accreditations

Certificates are accredited by the following international accreditation organizations: -

- 
British Accreditation Council (BAC)

Haward Technology is accredited by the **British Accreditation Council** for **Independent Further and Higher Education** as an **International Centre**. BAC is the British accrediting body responsible for setting standards within independent further and higher education sector in the UK and overseas. As a BAC-accredited international centre, Haward Technology meets all of the international higher education criteria and standards set by BAC.

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The International Accreditors for Continuing Education and Training (IACET - USA)

Haward Technology is an Authorized Training Provider by the International Accreditors for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Herndon, VA 20171, USA. In obtaining this authority, Haward Technology has demonstrated that it complies with the **ANSI/IACET 2018-1 Standard** which is widely recognized as the standard of good practice internationally. As a result of our Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for its programs that qualify under the **ANSI/IACET 2018-1 Standard**.

Haward Technology's courses meet the professional certification and continuing education requirements for participants seeking **Continuing Education Units (CEUs)** in accordance with the rules & regulations of the International Accreditors for Continuing Education & Training (IACET). IACET is an international authority that evaluates programs according to strict, research-based criteria and guidelines. The CEU is an internationally accepted uniform unit of measurement in qualified courses of continuing education.

Haward Technology Middle East will award **3.0 CEUs** (Continuing Education Units) or **30 PDHs** (Professional Development Hours) for participants who completed the total tuition hours of this program. One CEU is equivalent to ten Professional Development Hours (PDHs) or ten contact hours of the participation in and completion of Haward Technology programs. A permanent record of a participant's involvement and awarding of CEU will be maintained by Haward Technology. Haward Technology will provide a copy of the participant's CEU and PDH Transcript of Records upon request.

## Training Methodology

All our Courses are including **Hands-on Practical Sessions** using equipment, State-of-the-Art Simulators, Drawings, Case Studies, Videos and Exercises. The courses include the following training methodologies as a percentage of the total tuition hours:-

- 30% Lectures
- 20% Practical Workshops & Work Presentations
- 30% Hands-on Practical Exercises & Case Studies
- 20% Simulators (Hardware & Software) & Videos

In an unlikely event, the course instructor may modify the above training methodology before or during the course for technical reasons.



**Course Instructor(s)**

This course will be conducted by the following instructor(s). However, we have the right to change the course instructor(s) prior to the course date and inform participants accordingly:



**Mr. Robert Harvey**, MSc (Cum Laude), BSc is a **Senior Process & Chemical Engineer** with over **45 years** of in-depth industrial experience within the **Oil & Gas, Refinery, Petrochemical, Mining and Power** industries. His expertise widely covers in the areas of **Operations Abnormalities & Plant Upset, Fertilizer Manufacturing Process Technology, Fertilizer Storage Management (Ammonia & Urea), Petrochemical & Fertilizer Plants, Nitrogen Fertilizer Production, Petroleum Industry Process Engineering, Process Equipment Design &**

**Troubleshooting, Process Equipment & Piping Systems, Fertilizer Manufacturing Process Technology, Production Management, Process Plant Optimization & Continuous Improvement, Production Process Optimization, Process Analyzers, Process Equipment Design, Vinyl Chloride Monomer (VCM) Manufacturing & Process Troubleshooting, Cement Manufacturing Process Technology & Standards, Process Equipment & Piping System, Process Plant Optimization & Continuous Improvement, Process Plant Performance & Efficiency, Troubleshooting Process Operations, Modern Aluminium Production Processes, Cement Kiln Process, Process Engineer Calculations, Steel Making Process, Process Diagrams Review, Process Hazard Analysis (PHA), Process Mapping, Strategical Process Control in Process Industry, Revamping & Debottlenecking, Pressure Vessel Operation, Heat Mass Balance, Distillation-Column Operation, & Troubleshooting, Debottlenecking, Unit Performance Optimization, Real Time Online Optimization, Operations Planning Optimization, Engineering Problem Solving, Bag Filters Operation & Maintenance, Chemical Reaction Engineering Application, Phosphatic Industry, Diammonium Phosphate, Monoammonium Phosphate, NPK, Troubleshooting Improvement, Production Management, Distillation-Column Operation & Troubleshooting, Monomer Handling Safety, Complex Operational Troubleshooting, Incident Root Cause Analysis & Corrective Action, Fertilizer Manufacturing, Continuous Improvement & Benchmarking, Energy Efficiency for Process Plants, Pressure Vessel Operation, Reactors & Storage Tanks, Dehydrating Columns, Heat & Material Balance, P&ID Reading & Interpretation, Detailed Engineering Design, HAZOP Leadership, Project HSE Review (PHSER), Safe Handling of Propylene Oxide & Ethylene Oxide, Safety in Process & Industrial Plants, Environmental Impact Assessment (EIA) and Effective Risk Assessment & HAZOP Studies. Further, he is also well versed in Feasibility Studies Analysis & Evaluation, Project Gate System Procedures, Change Management Skills, Change Management Strategy, Developing Commercial Contracts, Project Management Skills, Project Scheduling & Cost Control, FIDIC & Other Model Contracts, EPC & EPCM Contracts, Knowledge Management, Job Evaluation, Creative Problems Solving & Innovation Skills, Problem Solving & Decision Making, Strategic Planning & Creative Thinking and Mind Mapping.**

During his career life, Mr. Harvey has gained his practical and field experience through his various significant positions and dedication as the **Commercial Director, Manufacturing Director, Chief Operating Officer, Head Projects Division, Project Leader, Lead Technical Advisor/Consultant and Project Consultant** to various international companies such as the Trade and Industrial Policy Strategies (TIPS), PGBI Johannesburg, IDC Green Industries SBU/Arengo 316 Pty Ltd, Ferrum Crescent Limited, CEF Limited, Rio Tinto Alcan, Industrial Development Corporation of SA (IDC) and AECI Limited.

Mr. Harvey has **Master (Cum Laude)** and **Bachelor** degrees in **Chemical Engineering**. Further, he is a **Certified Instructor/Trainer**, a **Certified Internal Verifier/Assessor/Trainer** by the **Institute of Leadership & Management (ILM)** and has delivered various trainings, seminars, conferences, workshops and courses globally.



### Course Program

The following program is planned for this course. However, the course instructor(s) may modify this program before or during the course for technical reasons with no prior notice to participants. Nevertheless, the course objectives will always be met:

#### **Day 1: Sunday, 04<sup>th</sup> of May 2025**

|             |   |
|-------------|---|
| 0730 – 0800 | Registration & Coffee   |
| 0800 – 0815 | Welcome & Introduction  |
| 0815 – 0830 | <b>PRE-TEST</b>   |
| 0830 – 0915 | <b>Introduction to Process Plant</b><br>Process Overview • Plant Types • Plant Layout • Process Equipment • Piping System • Control & Instrumentation • Safety                          |
| 0915 – 1000 | <b>Separators</b><br>Types • Application Ranges and Constraints • Construction Features and Options • Separators Internals  |
| 1000 – 1015 | Break   |
| 1015 – 1100 | <b>Separators (cont'd)</b><br>Selection • Operation • Control • Troubleshooting   |
| 1100 – 1215 | <b>Hydrates</b><br>Composition and Formation • Inhibitors and Prevention • Thermodynamics and Kinetics • Control • Troubleshooting  |
| 1215 – 1230 | Break   |
| 1230 – 1330 | <b>Gas Dehydration</b><br>Technologies • Absorption and Adsorption • Operation • Glycol Dehydration • Molecular Sieve Operations  |
| 1330 – 1420 | <b>Gas Dehydration (cont'd)</b><br>Performance Capabilities and Limitations • Operation • Control • Troubleshooting   |
| 1420 – 1430 | <b>Recap</b><br>Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow |
| 1430        | Lunch & End of Day One  |

#### **Day 2: Monday, 05<sup>th</sup> of May 2025**

|             |   |
|-------------|---|
| 0730 – 0900 | <b>Gas Sweetening</b><br>Acid Gases • Acid Gas Removal • Technologies • Absorption and Adsorption • Operation • Amine Sweetening  |
| 0900 – 1000 | <b>Gas Sweetening (cont'd)</b><br>Molecular Sieve Operations • Performance Capabilities and Limitations • Operation • Control • Troubleshooting   |
| 1000 – 1015 | Break   |
| 1015 – 1100 | <b>Condensate Stabilization</b><br>Technologies • Dew Point • Water Content • Heating Value • Joule Thomson • Product RVP • Specific Gravity • Corrosiveness                                |
| 1100 – 1215 | <b>Condensate Stabilization (cont'd)</b><br>Sweetness • Dryness • Operation • Advantages & Disadvantages • Performance Capabilities and Limitations • Operation • Control • Troubleshooting |
| 1215 – 1230 | Break   |
| 1230 – 1330 | <b>Fractionation</b><br>Flash Stages • Process Design Basic • Reflux Ratio • Minimum Reflux Ratio • Minimum Number of Plates • Optimum Reflux   |



|             |   |
|-------------|---|
| 1330 – 1420 | <b>Fractionation (cont'd)</b><br>Flash Stages • Process Design Basic • Reflux Ratio • Minimum Reflux Ratio • Minimum Number of Plates • Optimum Reflux                                  |
| 1420 - 1430 | <b>Recap</b><br>Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow |
| 1430        | Lunch & End of Day Two  |

**Day 3: Tuesday, 06<sup>th</sup> of May 2025**

|             |   |
|-------------|---|
| 0730 – 0900 | <b>Liquefied Petroleum Gases</b><br>Chemical Structure of Gases • Saturated and Unsaturated Hydrocarbons • Physical Properties • Bubble Points and Dew Points For Mixtures  |
| 0900 – 1000 | <b>Liquefied Petroleum Gases (cont'd)</b><br>Reliquefaction and Enthalpy • LPG Handling & Bulk Storage • LPG Cold Loading System • Vapor Recovery   |
| 1000 – 1015 | Break   |
| 1015 – 1100 | <b>Centrifugal Pumps</b><br>Configurations and Styles • Application Ranges and Constraints • Construction Features and Options • Pump Auxiliaries • Wear Components • Canned Motor and Magnetic Drive Pumps • High Speed/Low Flow Pumps • Servicing and Condition Monitoring • Operation • Control • Troubleshooting                          |
| 1100 – 1215 | <b>Positive Displacement and Vacuum Pumps</b><br>Reciprocating Steam and Power Pumps • Diaphragm Pumps • Plunger Pumps • Gear Screw and Progressive Cavity Pumps • Peristaltic Pumps • Conventional and Special Vacuum Pumps • Liquid Jet and Liquid Ring Pumps • Combination and Staged Vacuum Pumps • Operation • Control • Troubleshooting |
| 1215 – 1230 | Break   |
| 1230 – 1330 | <b>Centrifugal Compressors</b><br>Types, Styles and Configurations of Centrifugal and Axial Compressors • Construction Features • Mode of Operation • Compressor Auxiliaries and Support Systems • Condition Monitoring • Application Criteria • Performance Capabilities and Limitations • Operation • Control • Troubleshooting             |
| 1330 – 1400 | <b>Displacement Compressors</b><br>Classification • Reciprocating Compressors vs. Rotary Screw Compressors • Application Ranges and Limitations • Compression Processes • Construction Features and Components • Capacity Control • Operation • Troubleshooting   |
| 1400 – 1420 | <b>Fans and Blowers</b><br>Types and Configurations • Performance and System Effects • Performance Correction • Capacity Control Options • Operation • Troubleshooting  |
| 1420 - 1430 | <b>Recap</b><br>Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow   |
| 1430        | Lunch & End of Day Three  |

**Day 4: Wednesday, 07<sup>th</sup> of May 2025**

|             |  |
|-------------|--|
| 0730 – 0900 | <b>Valves</b><br>Valve Theory • Valve Types • Applications • Functions • Operation • Maintenance • Troubleshooting |
|-------------|--|







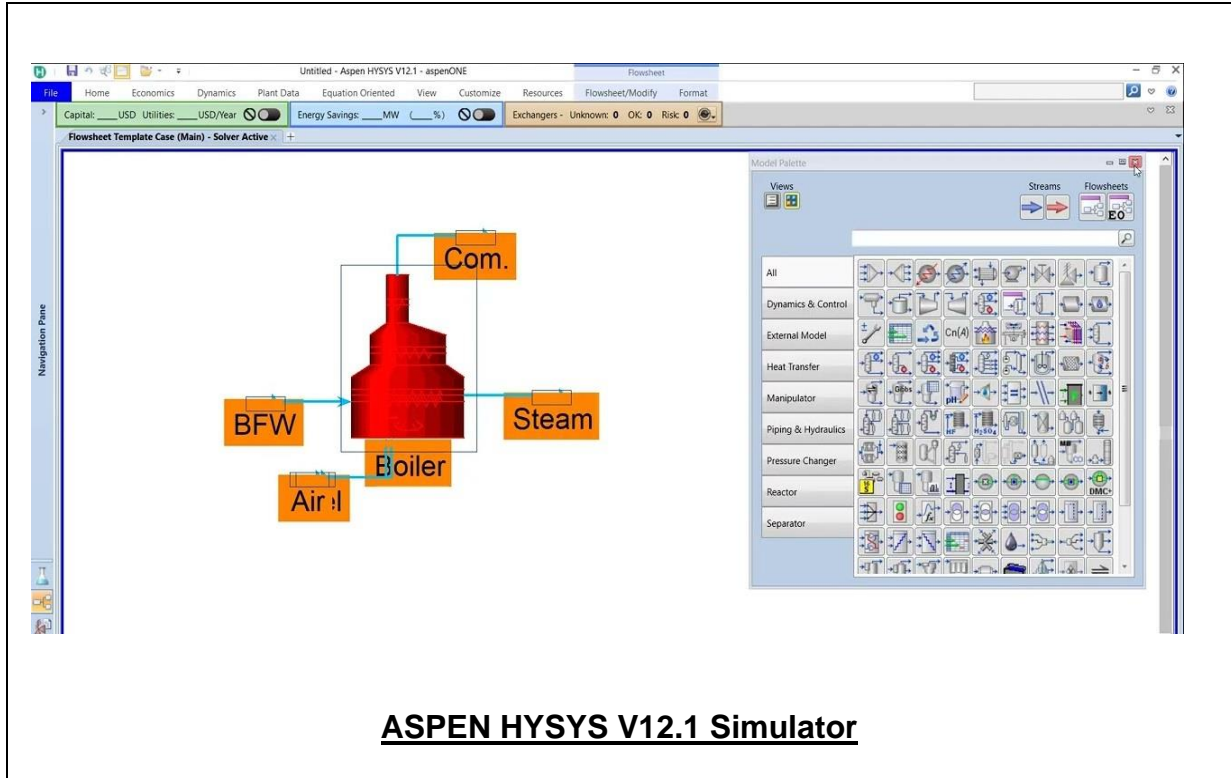
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| 0900 – 1000 | <b>Process Control</b><br>Control History • Basic Measurement Concepts • Performance Terms • Basic Control Theory  |
| 1000 – 1015 | Break  |
| 1015 – 1100 | <b>Pressure Measurement</b><br>Basic Principles • Pressure Transducers–Mechanical • Pressure Transducers–Electrical • Installation Considerations  |
| 1100 – 1215 | <b>Level Measurement</b><br>Main Types • Simple Sight Glass • Gauging Rods • Buoyancy Tape Systems • Hydrostatic Pressure • Ultrasonic Measurement • Radar Measurement • Vibration Switches • Radiation Measurement • Electrical Measurement • Installation Considerations |
| 1215 – 1230 | Break  |
| 1230 – 1330 | <b>Temperature Measurement</b><br>Principles • Thermocouples • Resistance Temperature Detectors (RTD's) • Thermistors • Non-Contact Types  |
| 1330 – 1420 | <b>Flow Measurement</b><br>Basic Flow Theory • Differential Pressure Flow Measurement • Oscillatory Flow Measurement • Magnetic Flowmeters • Ultrasonic Flow Measurement • Mass Flow Meters • Installation Considerations • Impact on Overall Loop                         |
| 1420 - 1430 | <b>Recap</b><br>Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow  |
| 1430        | Lunch & End of Day Four  |

**Day 5: Thursday, 08<sup>th</sup> of May 2025**

|             |   |
|-------------|---|
| 0730 – 0900 | <b>Control Valves–Body Types</b><br>Principles of Control Valves • What Happens Inside a Control Valve? • Choked Flow • Cavitation • Flashing • Valve Coefficient (Cv) • Control Valve Types • Valve Characteristics • Trim Characteristics • Control Valve Selection • Leakage Rates |
| 0900 – 1000 | <b>Control Valves–Actuators &amp; Accessories</b><br>Main Types of Actuators • Linear Actuators • Rotary Actuators • Actuator Forces • Positioners • Fail Safe Actuators  |
| 1000 – 1015 | Break   |
| 1015 – 1100 | <b>Pressure Relief Valves and Rupture Discs</b><br>Theory • Types • Applications • Functions  |
| 1100 – 1215 | <b>Pressure Relief Valves and Rupture Discs (cont'd)</b><br>Operation • Maintenance • Troubleshooting   |
| 1215 – 1230 | Break   |
| 1230 – 1245 | <b>Storage Tanks</b><br>Theory • Types • Auxiliaries and Internals • Applications & Constrains • Functions  |
| 1245 – 1300 | <b>Storage Tanks (cont'd)</b><br>Operation • Control • Maintenance • Troubleshooting  |
| 1300 - 1315 | <b>Course Conclusion</b><br>Using this Course Overview, the Instructor(s) will Brief Participants about the Course Topics that were Covered During the Course   |
| 1315 – 1415 | <b>COMPETENCY EXAM</b>  |
| 1415 – 1430 | Presentation of Course Certificates   |
| 1430        | Lunch & End of Course   |

**Simulator (Hands-on Practical Sessions)**

Practical session will be organized during the course for delegates to practice the theory learnt. Delegates will be provided with an opportunity to carryout various exercises using the simulator “ASPEN HYSYS”.



**Course Coordinator**

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