CANUSA-CPS

Corrosion Protection & Sealing

CASE STUDY

BU HASA INTEGRATED FIELD DEVELOPMENT PROJECT

LOCATED IN THE UNITED ARAB EMIRATES, THE BU HASA INTEGRATED FIELD DEVELOPMENT PROJECT STARTED IN NOVEMBER 2018 AND IS TO BE COMPLETED BY THE FIRST HALF OF 2022.

PROJECT NAME	Bu Hasa Integrated Field Development
YEAR	2018 - 2022
MARKET	Onshore, Oil and Gas Pipelines
LOCATION	United Arab Emirates
SCOPE	Supply of Field Joint Coating, Training, Equipment Rental
DIAMETER	3" to 24" OD x ~500kms
PRODUCT	GTS-PP & GTS-PE and Induction Heating Equipment

CHALLENGE

Owned and operated by ADNOC Onshore (formerly ADCO), Bu Hasa is one of the oldest producing onshore oil fields in the UAE and has been in operation since 1965. The oil field was originally developed with four central degassing stations (CDSs) located in different places, which were upgraded and relocated into a single centralized facility between 2003 and 2008.

Today, the Bu Hasa field development project produces up to 550,000bpd of oil, which is pumped into the Jebel Al Dhanna terminal for export. The project also involves new gas compression facilities, new production of water injection network, and an upgrade of the existing water treatment facilities. The objective of this project is to improve the overall production efficiency of the field through a second gas lift recovery phase, while streamlining the water handling and reducing the number of inactive wells on the field. The expansion of this project is expected to increase the daily production capacity of the field by 100,000 barrels.

APPLYING CANUSA-CPS FACTORY GRADE™ GTS-PP, GTS-PE WITH INDUCTION HEATING EQUIPMENT

SOLUTION

Recognized for our strategic presence in the GCC region, proven performance and project excellence, Canusa-CPS was selected as the supplier for ~42,000 field joint coatings by utilizing its **Factory Grade™ 3-Layer Coating Technology**, **GTS-PP** and **GTS-PE**, with **Induction Heating Equipment** on a 3” to 24” diameter pipe. The 3-Layer field-applied coating system provides low installation temperatures and a proven, uniform and repeatable application process and is fully compatible for use with induction heating. In addition to the supply of material and lease of induction heating equipment, installation training with a focus on automation and process control was provided by the Canusa-CPS Field Service team.

Significant efforts were made to meet the project requirements within the timeline set by ADNOC Onshore. Through our newly developed facility and operating location in Abu Dhabi, UAE, Canusa-CPS was able adapt to revisions in the project schedule set by ADNOC Onshore despite the ongoing Covid-19 pandemic through inventory management flexibility and best-in-class customer and technical service. The unpredicted impact of the pandemic resulted in Canusa-CPS being able to leverage its newly developed facility to hold and manage inventory without having to source additional warehousing facilities. Also, materials were stored in a compliant procedure as per applicable protocols. This ensured that risks associated with extended periods of storage on project sites located in harsh desert conditions were avoided.

ADNOC Onshore is one of the world's leading energy producers, and a primary catalyst for Abu Dhabi's growth and diversification with +46 years of success. ADNOC Onshore is currently operating 11 oil and gas fields in the UAE that produce 1.6 million barrels of oil and 5.6 billion cubic feet (bcf) of gas a day.

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CASE STUDY

JÖNKÖPING PROJECT

EXPANSION OF THE DISTRICT HEATING DISTRIBUTION NETWORK IN JONKOPING, SWEDEN.

PROJECT NAME	Jönköping
YEAR	2020 – 2021
MARKET	District Energy
LOCATION	Sweden
SCOPE	Supply of CSC-XP™ Casings & IntelliFUSE™ equipment for PE Casing
DIAMETER	O.D. from 355 mm – 800 mm
PRODUCT	CSC-XP™, IntelliFUSE™

CHALLENGE

A new distribution line from the Jönköping Energi Plant in Torsvik to city of Jönköping is currently being built to increase the district heating capacity (for the city of Jönköping, Sweden.) The primary distribution line is a dual PE 800 insulated pipeline with additional, smaller diameter lines connecting the system to the broader regional network.

Canusa-CPS was selected to supply our advanced joint casing system for pre-insulated pipelines, CSC-XP™ and our automated electro-fusion welding system, IntelliFUSE™.

Hantech System AB our Swedish partner supplied the CSC-XP casings with installation of the casings conducted by Freds Fjarrvarmeservice.

SOLUTION

The unique attributes of the **CSC-XP™** casing paired with **IntelliFUSE™** revolutionize the speed, efficiency and reliability of the field welding process and the long-term integrity of the field joint once in service. The system provides unmatched performance for the field-installed, electro-fused joint protection system.

CSC-XP™ utilizes HybridPEX™ Technology which combines the advantages of cross-linked and uncross-linked polyethylene in a single product. The cross-linked polyethylene outer layer maintains hoop stress on the pipe over the design life and resists premature recovery in hot climates. The uncross-linked polyethylene inner layer of the casing allows for effective welding (IntelliFUSE™) of the material to the mainline PE jacket pipe. This advanced grade of high-density bimodal polyethylene offers enhanced resistance to abrasion, impact, penetration and cracking, especially at low temperatures.

JONKOPING PROJECT SITE

CSC-XP™ CASING INSTALLATION

INSTALLED CSC-XP CASINGS

SEALFORLIFE Industries

ONE **COMPANY** INNOVATIVE **TECHNOLOGY** ULTIMATE **PROTECTION**

www.sealforlife.com

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CASE STUDY

CAPACITY4GAS PROJECT

LOCATED IN CHOMUTOV, CZECH REPUBLIC, THE CAPACITY4GAS PIPELINE PROJECT STARTED IN DECEMBER 2019 AND IS AN ONGOING PROJECT FOR 2020.

PROJECT NAME	Capacity4Gas
YEAR	2019/2020
MARKET	Onshore, Gas Pipeline
LOCATION	Czech Republic
SCOPE	Supply of Field Joint Coating, Training
DIAMETER	56" OD
PRODUCT	GTS-65 System and Induction Heating Equipment

CHALLENGE

This project continues during the second half of 2020 and demonstrates the operational benefits that Canusa-CPS training and certification programs have on maintaining competency in applying field joint coatings on long duration large diameter onshore projects.

Known for our proven track record of product performance and project excellence, Canusa-CPS was selected as the supplier for 4000 field joint coatings utilizing GTS-65 Heat Shrinkable Sleeves with Induction Heating Equipment on a 56” diameter pipe. This product selection mirrored the products used on the successful sister project “Gazelle” in 2011. This system provides superior corrosion protection and excellent bonding on pipelines operating up to 65°C.

SOLUTION

In addition to supply of material and lease of **induction heating equipment**, installation training and certification for the Denys coating team was provided by the Canusa-CPS Field Service team to give the client confidence that all best practices were adhered to while ensuring high productivity rates.

This training included elements of automation and process control. Our Field Service team provided training on the use of Induction Heating technology as part of the field joint coating process to generate uniform heating of the pipeline cutback prior to coating application.

Denys N.V. (HQ Belgium) provides civil engineering services. The company designs, constructs, and installs pipelines, tunneling systems, earthworks, transport infrastructure, water networks, as well as offers renovation and restoration services. Canusa-CPS has had the pleasure of working with Denys N.V. successfully over many years.

APPLYING INDUCTION HEATING EQUIPMENT

INDUCTION HEATING IN PROCESS

GTS-65 + INDUCTION HEATING EQUIPMENT

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CASE STUDY

EVIDES PROJECT

LOCATED IN NATIONAL PARK DE BIESBOSCH, NETHERLANDS, THE EVIDES WATER PIPELINE PROJECT STARTED IN JANUARY 2020 AND WILL BE COMPLETED IN SEPTEMBER 2020.

PROJECT NAME	Evides
YEAR	September 2020
MARKET	Water Pipeline
LOCATION	Netherlands
SCOPE	Supply of Abrasion Resistant Overcoat, Training
DIAMETER	84” OD
PRODUCT	ScarGuard®

CHALLENGE

The New Intake Pump Station Bergsche Maas required construction of 3 x 1.5 km of underground transmission lines from the intake pump station to the De Gijster savings basin.

Due to the increased demand of water, there was a need to ensure the security of supplying drinking water and the necessity of providing industrial water in the future.

The product which was initially applied to this project did not provide the required mechanical protection needed to protect the underlying pipeline coating and this resulted in project delays with the risk of not completing the project on time.

Known for our product performance, ease-of-installation and project excellence, Canusa-CPS was selected on a short notice to replace the ineffective product used for this project.

EVIDES PROJECT, NETHERLANDS

SCARGUARD® APPLIED ON WATER PIPELINE

SOLUTION

Canusa-CPS responded to the client call and recommended applying **ScarGuard®** for its fiber-reinforced composite mechanical protection system to the field joint coating on an 84” diameter pipeline.

In addition to material supply, onsite training on the installation of ScarGuard® for the Denys coating team was provided by the Canusa-CPS Field Service team. Given its ease-of-application, no UV light or heating was required when installing ScarGuard®.

From health and safety aspect, our dedicated team confirmed that no negative impact or hazards were introduced to the working site. This has increased our client confidence level for selecting Canusa-CPS mechanical protection system and completing the project on time with a quick and safe installation.

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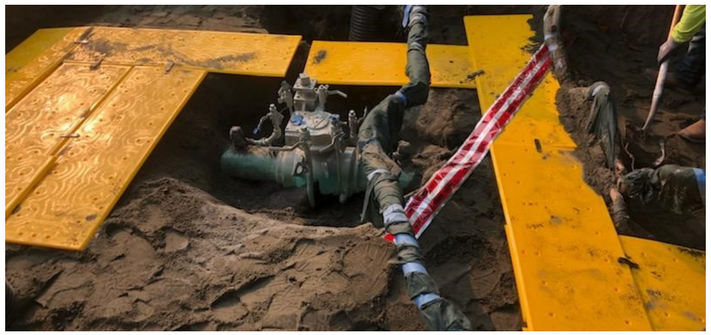
CASE STUDY

OVERPIPE 8TH MAINLINE PROJECT

LOCATED IN THE USA, THE 8" MAINLINE PROJECT BY ONE OF THE LARGEST OPERATING COMPANIES WHICH PROVIDES NATURAL GAS AND ELECTRIC SERVICES TO ~16 MILLION PEOPLE. THE PROJECT STARTED IN JULY AND WAS COMPLETED IN AUGUST 2020.

PROJECT NAME	8" Mainline
YEAR	2020
MARKET	Gas Distribution
LOCATION	USA
SCOPE	Protect 8" natural gas mainline pipelines with shallow cover near highway
DIAMETER	8" OD
PRODUCT	Overpipe®



CHALLENGE

The operating company was concerned that two 8" mainlines were susceptible to third party damages due to the location and depth of cover. These assets were located near a highway where a pipeline incident would potentially have severe consequences. Historically, the company has used concrete slabs for mechanical protection which required heavy equipment to install and add additional risk to personnel safety. This location was too confined for concrete slabs and it was cost prohibitive to bury the pipelines deeper.

SOLUTION

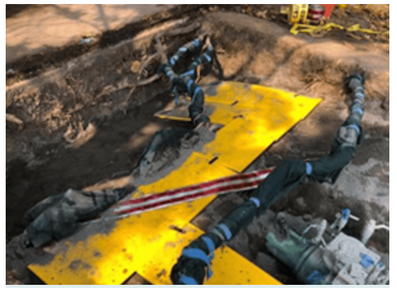
By understanding the potential consequences, health and safety of people and project needs, Canusa-CPS recommended to apply **Overpipe®** mechanical protection plates which were deployed over the two 8" mainlines. Some Overpipe plates were cut to size to fit specific areas over the pipeline which provided an additional layer of safety.

In addition, assets located in high consequence area were protected with Overpipe plates as an alternative to burying the pipelines deeper or using concrete slabs. Therefore, Overpipe® saved the company significant amount of money by reducing man hours and equipment cost.

The operating company was pleased with the outcome and use of Overpipe®. They noted that some of the Overpipe plates were easily modified (cut) with power tools to meet the site requirements with safe installation and increased efficiency.

OVERPIPE PLATES ARE LIGHTWEIGHT AND EASY TO INSTALL

OVERPIPE DOES NOT INTERFERE WITH LINE LOCATING EQUIPMENT



OVERPIPE CAN WITHSTAND VIRTUALLY ANY IMPACT ENSURING YOUR ASSET IS PROTECTED

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Corrosion Protection & Sealing

CASE STUDY

GASODUCTO SUR PERUANO PIPELINE (GSP) PROJECT

When superior pipeline protection was needed for one of Peru's most significant natural gas transportation projects, we delivered a solution for the long term.

PROJECT NAME	Gasoducto Sur Peruano Pipeline (GSP) Project
YEAR	2017
MARKET	Natural gas pipeline
LOCATION	Peru
SCOPE	Protect the girth weld joints of about 650 km of the GSP pipeline
DIAMETER	32", 24" and 14" ODs
PRODUCT	GTS-65™ three-layer transmission sleeve system

CHALLENGE

Estimated to increase Peru's GDP by 1.0 to 2.5 percentage points, the Gasoducto Sur Peruano pipeline (GSP) represents one of the country's most significant economic projects. Expected to come online in 2017, the 1,150 km–long pipeline will begin in Cusco and end on Moquegua's southern coast, connecting production from the prolific Camisea gas fields in central Peru with the country's southern regions. But challenges stemming from tough terrain and a lack of a trained local workforce have caused concerns about construction efficiency and impacts to the asset's future pipeline performance. So, the Gasoductu Sur Peruano consortium selected Canusa-CPS to help drive solutions.

SOLUTION

To protect the girth weld joints of about 650 km of the GSP pipeline with ODs of 32", 24" and 14", we chose our **Canusa-CPS GTS-65™** three-layer transmission sleeve system. With the system's advanced adhesive technology, lower preheat temperatures are required to attain true adhesive wet-out and superior bonding to the pipe's surface coating—making installations more efficient, even in challenging terrains, while still providing excellent resistance to cathodic disbondment and corrosion.

To ensure the appropriate installation of the sleeve system, the Canusa team provided extensive training and resources to installation crews, guaranteeing our recommended application standards will be met for the duration of the project in the high inclination terrain. Our training efforts have been particularly beneficial to the client as, following the completion of the Transportada de gas del Peru (TGP) pipeline in 2004, Peru's last major pipeline project, many people who worked on it left the country in search of work where demand for their skills was greater. As a result, much of the local workforce has required both initial and ongoing training.

With Canusa's GTS-65™ three-layer transmission sleeve system and training resources provided to local crews, we are not only helping to increase installation efficiency for the GSP pipeline project, but also ensuring its future pipeline performance with the long-term protection of its girth weld joints.

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CASE STUDY

ARGENTINA GNEA PROJECT

FOR A SIGNIFICANT ARGENTINE PIPELINE, WE LEVERAGED OUR LOCAL RESOURCES AND EXPERTISE TO PROVIDE A SUPERIOR PIPE COATING SYSTEM SOLUTION.

PROJECT NAME	Argentina GNEA Project
YEAR	2015
MARKET	Natural Gas Pipeline
LOCATION	Argentina
SCOPE	Protect the girth weld joints of 310 miles (500 kilometers) of trunklines and (450 kilometers) of branchlines.
DIAMETER	Trunklines: 24" OD & branchlines: 4-1/2", 6-5/8", 8-5/8",10-3/4" ODs
PRODUCT	GTS-65™ transmission sleeve system and DDX™ system

CHALLENGE

When construction of Argentina's GNEA natural gas pipeline is complete, up to 27.7 million cubic meters of natural gas per day will be transported from the Margarita Gas Field in Bolivia to Argentina's northern and central provinces. With approximately 925 miles (1,490 kilometers) of trunklines and 1,677 miles (2700 kilometers) of branchlines required for the project, Argentina's state-owned oil company, Enarsa, needed pipe coating solutions providers with the right logistics and installation support capabilities to ensure the integrity and performance of the pipeline for its lifetime use. Due to our coating facilities near Buenos Aires and our global experience on similar projects, Canusa-CPS was selected to provide both the coating and transmission sleeves for the entire trunkline and portions of the branchlines on the GNEA pipeline system.

With Canusa-CPS, Enarsa will realize its goal of ensuring the long-term pipeline performance and corrosion resistance of the GNEA pipeline system. Due to Canusa's conveniently located regional facility, which expedited the delivery of coated pipe to the project location, and our training resources, we helped the project save time and money.

SOLUTION

We applied our 3LPE anti-corrosion coating to 925 miles (1,490 kilometers) of trunklines with an OD of 24" in our facility in Valentín Alsina, the only coating plant in Argentina capable of applying external coatings on steel pipes with diameters of 20" to 42". More than 90 miles (150 kilometers) of branchlines with an OD of 10-3/4" were applied at our Escobar site.

Canusa-CPS provided **GTS-65™** transmission sleeve system for the project to protect the girth weld joints of 310 miles (500 kilometers) of trunklines with a 24" OD and 280 miles (450 kilometers) of branchlines with ODs of 4-1/2", 6-5/8", 8-5/8" and 10-3/4". Additionally, the horizontal directional drilling applications in the project used Canusa's **DDX™** system to deliver consistent anti-corrosion properties while improving abrasion, gouge and shear resistance needed to preserve the field joint coating system during the pipeline pull-through process.

Canusa's GTS-65™, which provides superior corrosion protection, was supplied in a tailor-made thickness to comply with Enarsa specification requirements. Thus, not only did Canusa-CPS provide consistent corrosion and mechanical impact resistance across the entire pipeline, we also increased installation efficiency. Thanks to our extensive on-site training provided by experts from our field service engineering team to the contractor crews, we ensured the proper installation of the products.

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CASE STUDY

UMM LULU PROJECT

TO HELP SUPPORT THE UAE'S INITIATIVES TO INCREASE OFFSHORE CRUDE OIL PRODUCTION, WE ENSURED THE LONG-TERM PROTECTION OF A KEY FIELD'S PIPE INFRASTRUCTURE.

PROJECT NAME	Umm Lulu Project
YEAR	2014
MARKET	Offshore Oil and Gas
LOCATION	Arabian Gulf, UAE
SCOPE	Provide field joint coating solution for approximately 121 miles (194 kilometers) of subsea pipelines
DIAMETER	6", 8", 16", 10.75", 18" & 20" ODs
PRODUCT	Factory Grade™ GTS-PP and GTS-PE field-applied girth-weld coating solutions

CHALLENGE

The Umm Lulu field, located in the Arabian Gulf just 18 miles (30 kilometers) northwest of Abu Dhabi, will help support a strategic initiative by the UAE to pump 1.75 million barrels of offshore crude oil per day by 2017. So when the Abu Dhabi Marine Operating Company (ADMA-OPCO) required a proven high-performance field joint coating solution for approximately 121 miles (194 kilometers) of subsea pipelines, Canusa-CPS provided the right product and technical expertise to assist in successfully executing this pipeline installation.

SOLUTION

For this critical offshore application, we supplied our market-leading **Factory Grade™ GTS-PP** and **GTS-PE** field-applied girth-weld coating solutions along 40 miles (65 kilometers) of 3LPP and 80 miles (129 kilometers) of 3LPE coated pipe, respectively. Canusa-CPS advanced heat shrink sleeves are composed of the same high-grade raw materials utilized to coat the 3LPE and 3LPP linepipe, and demonstrate our abilities to deliver seamless coating integrity along the entire length of the pipeline. To support a high-quality installation and efficient vessel cycle times, Canusa-CPS provided operator training and induction heating equipment to the subsea lay contractor.

Convenient supply chain management and field engineering support were delivered from our technical services hub located in Mussaffah, UAE. From this strategic location, we provided rapid response and immediate deployment of products and technical resources upon customer request for flawless project execution.

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CASE STUDY

KASHAGAN OFFSHORE OIL FIELD PROJECT

FOR THE WORLD'S LARGEST OIL FIELD DISCOVERY IN THE PAST FORTY YEARS, ONLY PROVEN COATING PROTECTION WOULD DO.

PROJECT NAME	Kashagan Offshore Oil Field Project
YEAR	2007 - 2010
MARKET	Offshore Oil & Gas
LOCATION	Caspian Sea, Kazakhstan
SCOPE	Coating 2,000 kilometers of pipeline with 7,700 joints
DIAMETER	28" OD
PRODUCT	GTS-80, Liquid Epoxy E, WrapidShield PE™

CHALLENGE

Kashagan Field is an offshore oil field discovered in the Kazakhstan sector of the Caspian Sea in 2000. This field extends over a surface area of 75 kilometers by 45 kilometers – with recoverable reserves of about 4.7 billion tons of crude oil. The development of Kashagan took place in the northern part of the Caspian Sea; which required the extension of offshore fields to a processing facility onshore.

Given the unique complexities of technical, supply chain management, logistical and environmental challenges, Kashagan Field is recognized for being the most sophisticated industrial project in the world.

Kashagan seeks to have solid operations, secure pipeline coating solutions and reliable field joint technology to stand up in the harshest weather environment conditions (from −35 to 40 °C) with pack sea ice movements – and that's where we contributed.

SOLUTION

To improve cycle times meeting Kashagan project's installation phases, Canusa-CPS coated 2,000 kilometers of pipeline with 7,700 joints with 28" of **Canusa-CPS GTS-80** with **Liquid Epoxy E** and 9,380 joints with 28" of **Canusa-CPS WrapidShield PE™** combined with GTS-80 for offshore mechanical protection.

Canusa-CPS provided the project with superior anti-corrosion and advanced mechanical protection. The ISO 21809-3 certified field-applied coating solution was delivered with detailed lab testing, dedicated personal training and efficient supply chain management.

Despite the harsh offshore environment of the northern part of the Caspian Sea, all coatings were installed successfully with superior corrosion protection and excellent bonding on pipelines with mechanical protection.

We ensured long-term corrosion protection by adding flexible sleeve installations to meet the harsh weather temperature on pipelines operating from −35 to 80 °C. Since 2007, Canusa-CPS has been steadily applying the best technologies to field-applied coating systems. We used this experience to provide superior end-to-end pipeline coating performance during the construction phases of Kashagan project.