

ITEM NO.	PROJECT TITLE	CLIENT	PROJECT DESCRIPTION
1)	THE UPGRADE OF EXPORT & BLENDING FACILITIES AT PETRONAS BUNKERING DEPOT, PULAU INDAH	PETRONAS TRADING CORPORATION SDN BHD (PETCO)	<p>Petronas Dagangan Bhd. (PDB) operates a bunkering depot at Westport, Pulau Indah. Currently, the depot is capable of importing fuel oil of grades 380 cSt and diesel fuel. These are supplied as bunker fuel to ship plying/stopping over at West Port. Blending facilities are also available to produce fuel oil of grade 180 cSt by mixing 380 cSt FO with diesel. With the existing tankage and loading facilities available, it appears that these facilities were under utilised.</p> <p>Chalpoint was appointed as the consultant to perform a feasibility study to achieve the following objectives:</p> <p>A) Upgrading and enhancement of the existing export and blending capabilities considering the following:</p> <ul style="list-style-type: none"> • Utilising existing import facilities (loading arms, piping, etc.) to allow bulk export of blending fuel oil. • Recommend best technology to retrofit two existing tanks to allow blending for product export. • Recommend the feasibility of importing 650 cSt Fuel Oil. • Any other recommendations to optimise the above studies. <p>B) The options of not installing blending facilities to reduce the cost of the project were also studied. Only upgrading of the pumping facilities and retrofit of the existing tanks for receiving and storage of fuel oil for re-export are considered.</p>
2)	UCB CRYLCOAT PLANT EXPANSION PROJECT	UCB MALAYSIA	<p>UCB Chemicals (M) Sdn Bhd undertook to expand its chemical complex producing resins for specialty coatings located approximately 7.5 km southeast of Seremban in the Tuanku Ja'afar Industrial Park. The existing Seremban plant was designed and built with future expansion in mind such that space and area for buildings and major equipment for anticipated expansion have been pre-allocated. The expansion of this plant was on a 'fast-track' basis.</p> <p>The project includes the Engineering, Procurement, Construction, Pre-commissioning and Start up assistance works for new equipment, facilities and modification required for the expansion project as follows;</p> <ol style="list-style-type: none"> 1) A new 150 MT TPA (raw material) storage silo and associated facilities 2) A new reactor, R3 and associated facilities; A new reactor, R4 (option) 3) A new 26 MT product silo and associated facilities 4) Replacement of the existing 2 product filters 5) A new 70 Ton/hr water chiller 6) A new 10 MMBtu/hr hot oil heater 7) A new cooling water tower (CWT) and a new MCC <p>Chalpoint performed the basic engineering and prepared the bid package for the project.</p>

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3)	DESIGN OF DILUTE TETRACHLORIDE HOLD UP TANK AND ASSOCIATED FACILITIES	HUNTSMAN TIOXIDE	<p>Tioxide Malaysia (M) Sdn Bhd awarded Chalpoint a contract for Detailed Engineering of a new dilute tetrachloride hold up tank and associated facilities at the Surface Treatment Building, Kawasan Industri Teluk Kalung, Kemaman, Terengganu.</p> <p>Chalpoint performed the detailed engineering of the tank that included piping, in-line instruments and associated facilities.</p>
4)	PROVISION OF HSE TECHNICAL SERVICES AND DOCUMENTATION	LUNDIN MALAYSIA LTD	<p>Lundin Malaysia Limited (LML) undertook the development of the PM 3 fields. The PM 3 field consists of Bunga Kekwa, Bunga Raya, Bunga Orkid, Bunga Pakma, North Bunga Pakma, Bunga Seroja and Northwest Bunga Raya.</p> <p>The development of the fields was divided into 3 phases. Phase 2, which was the installation of a Central Processing Platform (CPP) at Bunga Raya (BR-A) with a bridge linked well head riser platform, and well head platform at the Bunga Seroja, North west Raya Fields and Bunga Kekwa fields. Phase 3, was the installation of wellhead platform at the East Bunga Kekewa – Cai Nuoc fields.</p> <p>The scope of work for Chalpoint were the provision of technical services and documentation including the following:</p> <ul style="list-style-type: none"> • Review HSE requirements in LML’s contract with Petronas and other partners. • Review HSE specifications in LML’s Terms of Reference (TOR) to EPC contractors. • Develop Lundin’s Corporate HSE Management System. • Determine the project criteria for all quantitative analysis results i.e. individual risk criteria, oily water discharge concentrations criteria, radiant heat impairment levels, TR impairment criteria etc.
5)	SAFETY CASE FOR FSO AT BLOCK PM3 CAA FIELD DEVELOPMENT	TPOT (BUNGA RAYA) PTE. LTD.	<p>TPOT (BUNGA RAYA) PTE LTD, a company incorporated in Singapore was responsible for project managing aspects of the design, engineering, construction, conversion, installation and supply of a Floating, Storage and Offloading facility (FSO). In that capacity, the company engaged Chalpoint to provide safety case consultancy services in relation to the FSO.</p> <p>The overall scope of work was to prepare and submit a Safety Case for the PM3 CAA FSO. The scope of work included the following:</p> <ul style="list-style-type: none"> • Review of the FSO design and operating philosophy • Initial Hazard Identification (HAZID) • Initial Hazard & Operability (HAZOP) Study • Formal Safety Assessment (FSA) • Review of proposed facilities Safety Management System (SMS)

ITEM NO.	PROJECT TITLE	CLIENT	PROJECT DESCRIPTION
			<ul style="list-style-type: none"> Preparation of Facility SMS Documentation Preparation of Safety Case Document
6)	FPSO PERINTIS – LOW TEMPERATURE CENTRAL FRESH WATER COOLING SYSTEM OPTIMISATION STUDY	TRENERGY FPSO, MALAYSIA	<p>The Perintis’s Floating, Production, Storage and Offloading (FPSO) facility is owned by Trenergy FPSO Sdn Bhd in MASA field, offshore Terengganu.</p> <p>The potable water system for Perintis FPSO is generated from the sea water distilling plant via two Alfa Laval Fresh Water Generator (FWG). The FWG is a plate heat exchanger type. The evaporator part of FWG is currently using saturated steam at temperature above 100 degC as heating medium. This has created high scaling rate to the Titanium plate of the FWG which in turn increase the plate change out frequency.</p> <p>The objective of the engineering design services study was to undertake the proposed facility modification project. This process engineering report covers the synopsis of various studies, engineering documents and calculations undertaken during the course of engineering design of the facility.</p> <p>The scope of work for the process includes the engineering design studies of the existing FWG facilities that leads to the modifications required on the existing FWG complex for better operations. The recommendations and conclusions derived from the engineering studies done on FWG facilities by process equipment calculations and were addressed. The existing FWG P&ID’s and control philosophy were modified to include a new system tie-in.</p>
7)	HAZARD IDENTIFICATION (HAZID) STUDY FOR CONCURRENT OPERATIONS FOR PHASE 2 & 3 PROJECT DEVELOPMENT	TALISMAN MALAYSIA LIMITED	Talisman (M) Ltd procured the services of Chalpoint to carry out the Hazard Identification (HAZID) Study for Concurrent Operations for Phase 2 & 3 Project Development.
8)	DEVELOPMENT OF HYSYS MODEL FOR ALLOCATION PROCEDURE FOR PHASE 2 & 3 PROJECT DEVELOPMENT	TALISMAN MALAYSIA LIMITED	Talisman (M) Ltd engaged Chalpoint to carry out the Development of HYSYS Model for Allocation Procedure for Phase 2 & 3 Project Development.
9)	DYNAMIC SIMULATION MODEL FOR BR-A & BR-D PLATFORMS (ADDITIONAL RUNS)	TALISMAN MALAYSIA LTD	<p>Talisman (M) Ltd own and operate the Bunga Raya-A Central Processing Platform (BR-A CPP) and Bunga Raya-D Central Processing Platform (BR-D CPP).</p> <p>The scope of work by Chalpoint was to perform five dynamic runs to investigate the impact different gas flowrates on the system. This included looking at:</p> <ul style="list-style-type: none"> Increase in the gas flowrate to the 1st stage separator on BR-A by 10 MMscfd; Increase in the gas flowrate to the BR-D separator from BR-C by 10 MMscfd; Increase in the gas flowrate to the 1st stage separator on BR-A by 10 MMscfd and a line connecting the discharge of BR-A flash gas compressors to the suction of the BR-D injection compressors;

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			<ul style="list-style-type: none"> Review the impact of the increased gas flowrate on the separator efficiencies and compliance with PTS 31.22.05.11; Two additional runs to be defined based upon the results of the above.
10)	CPP RESAK PIPELINE START-UP TRANSIENT STUDY	TALISMAN MALAYSIA LTD	<p>Talisman (M) Ltd own and operate the Bunga Raya-A Central Processing Platform (BR-A CPP). During the commissioning of the BR-A CPP to Resak Export pipeline there were concerns about the potential to damage the topsides piping and equipment should be there be a trip during pipeline pressurisation as the topsides is not designed for vacuum condition.</p> <p>The objectives of the study were to determine the pressurisation time from 3 mbar absolute to 0 barg; and to determine the topside pressure following a trip during pressurisation.</p> <p>The scope of work awarded to Chalpoint was to perform dynamic runs to evaluate possible impacts on CPP topsides against start-up of Resak Pipeline [from vacuum condition (3 mbar abs)]. This included:</p> <ul style="list-style-type: none"> Resultant topsides pressure / vacuum in the event of trip (at time=0) while the Resak Pipeline is still under vacuum; The duration / quantity of gas required to bring the pipeline from 3 mbar abs to ~0 bar gauge condition.
11)	CIMAH REPORT FOR SABAH GAS TERMINAL (SBGAST)	PETRONAS CARIGALI – SABAH OPERATIONS	<p>Petronas Carigali Sdn. Bhd. (PCSB) Sabah Operations own and operate the Sabah Gas Terminal which is categorized as a CIMAH (Control of Industrial Major Accident Hazards) site and was now due for its 3-yearly CIMAH Report update.</p> <p>The scope of work for this assignment was to update the existing CIMAH Reports for the Sabah Gas Terminal (SGAST) in compliance with the requirements of the CIMAH Regulations 1996 which is enforced by the Malaysian Department of Occupational Safety and Health (DOSH).</p> <p>This scope is anticipated to include the following activities:</p> <ul style="list-style-type: none"> Site visit to verify the existing conditions at the SGAST facility; Review and update of the process and stored inventories of all classified hazardous material (Part I of the CIMAH Report); Review and update of the SGAST installation (Part II of the CIMAH Report); Review and update of the Safety Management System (SMS) in place (Part III of the CIMAH Report); and Review and update of the major accident hazards (Part IV of the CIMAH Report). Provide consultation to site personnel during site visit Conduct a presentation for the CIMAH report updates to Petronas Sabah Operations.

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12)	CO2 BLENDING DYNAMIC SIMULATION STUDY FOR BR-A & BR-D	TALISMAN MALAYSIA LTD	<p>Talisman (M) Ltd own and operate the Bunga Raya-A Central Processing Platform (BR-A CPP) and Bunga Raya-D Central Processing Platform (BR-D CPP). Dynamic Simulation Study of Flash Gas Compressors on BR-A & BR-D comprised the following:</p> <ol style="list-style-type: none"> 1) A dynamic simulation model was developed using HYSYS on 2 cases: <ul style="list-style-type: none"> • As existing system with crossover modified to remove control valve and check valve. • As above but with flash gas compressor on BR-D in place of the booster compressor. 2) The dynamic simulation model was verified against the compressors real operating performance with comparison of the dynamic simulation model and real operating data. 3) The dynamic simulation included an evaluation of the system response to the expected future operation of the BR-A and BR-D flash gas compressors during normal and upset conditions with scenarios for both existing and future cases.
13)	SECURITY SURVEILLANCE SYSTEM & UPGRADING OF NORTH GATE AND SOUTH GATE	HUNTSMAN TIOXIDE	<p>Tioxide Malaysia (M) Sdn Bhd awarded Chalpoint the engineering services contract to renovate existing North Gate and South Gate guard houses and upgrade the overall plant security surveillance system at Kawasan Industri Teluk Kalung, Kemaman, Terengganu. The project included new equipment, facilities and modification as follows;</p> <ol style="list-style-type: none"> 1) Architectural and Civil/Structural <ul style="list-style-type: none"> • Renovation of Main Entrance at North Gate. • Renovation of north Gate and South Gate guard houses. • Construction and/or renovation of other associated facilities. • Cold water supply, sanitary plumbing and sewerage. 2) Electrical <ul style="list-style-type: none"> • Tie-in and cable routing of electrical power to North Gate and South Gate for Security Surveillance System and associated facilities. • Electrical Switchboard, Cable, Lighting, telephone and IT connection and other fittings. • Installation of grounding and lightning protection
14)	NEW WATER TREATMENT PLANT AT UNITY POWER PLANT (MUGLAD BASIN OIL) FOR GNPOC, SUDAN	PT TECHNIC/GNPOC, SUDAN	<p>The Greater Nile Petroleum Operating Company Ltd. (GNPOC), the Operator for the Consortium comprising of CNPC, Petronas, ONGC and Sudapet Ltd is responsible for the field development of the Muglad Basin Oil Project in Sudan.</p> <p>The expansion of the existing Unity Power Plant's facility involved the addition of 3 engines and another 2</p>

ITEM NO.	PROJECT TITLE	CLIENT	PROJECT DESCRIPTION
			<p>engines to be installed later. The total number would eventually increase to ten (10) engines.</p> <p>The new water treatment system will treat the raw water to cater for additional steam demand and to ensure the availability of the treated water in the plant. A continuous and reliable treated water supply is highly essential to ensure that the reliability and availability of plant boiler system since the steam generated will be the main energy supply to the system. Therefore the performance of water treatment system is very critical in running the power plant.</p> <p>The new water treatment system is located within the existing Unity Power Plant (UPP) close to Unity FPF approximately 800 km southwest of capital Karthoum and approximately 1400 km from seaport of Sudan.</p> <p>Chalpoint performed the detailed engineering of the entire facilities including Civil, Structural, Mechanical, Piping, Electrical, Instruments and Process.</p>
15)	ENGINEERING, PROCUREMENT, CONSTRUCTION & COMMISSIONING FOR PDH DEPRONIZER REVAMP PROJECT AT MTBE	SHAPADU ENERGY & ENGINEERING	<p>MTBE Malaysia Sdn. Bhd. (MMSB) intended to revamp the existing Depropanizer Column at PDH Plant: owned and operated by MMSB at Gebeng, Kuantan, Malaysia in order to minimize C4+ slip in the feed propane.</p> <p>The modification involved the replacement of the existing valve trays of the Depropanizer Column with a combination of new UOP ECMD and MD trays and modification of Depropanizer Fractionation circuits.</p> <p>Chalpoint was engaged by the main EPC contractor, Shapadu Energy & Engineering for the detailed engineering of the modification works as follows:</p> <ol style="list-style-type: none"> 1. Reconfirmation of system hydraulics by calculations and checks based on final piping plan and isometrics to meet the design intent. 2. Detailed engineering of civil and structural works including foundation and civil structure for piping system and others. Existing piping structure was checked for the additional load by newly installed piping or equipment and others weight. 3. Organizing and conducting HAZOP, updating P&ID's, updating process specifications as a part of equipment, instruments, electrical data sheet, updating line schedule and implementing any other process changes as deemed necessary during the course of detailed engineering design. 4. Provide all drawing, specification, calculations, data sheets and instructions required for operation of the plant, 5. Review all existing related works discipline documents to ensure consistency. 6. Provide relevant qualified and certified manpower as required by the Local authority or Statutory requirement such as to approve and endorsed the relevant documents. 7. Arrange for submission and approval from Department of Safety and Health of any modification to any certificated equipment.

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			8. Produce all as-built drawings relevant to the project including P&ID, piping GA, etc. 9. Develop detail blinding and de-blinding scheme for process line isolation and line blowing including utility line.
16)	MODIFICATION OF TK-14 FOR LSWR SERVICE	ESSO MALAYSIA BERHAD, PORT DICKSON REFINERY	Esso Malaysia Berhad engaged Chalpoint for the Detailed Engineering services for Modification of Tk-14 for LSWR Service at Port Dickson Refinery, Negeri Sembilan. Tk-34 (currently for LSWR service) is under study for conversion to crude tank, to allow the refinery to run other profitable crude. To replace Tk-34, Tk-14 that is currently idle was proposed to be converted to LSWR service. The scopes of the project are as follows: <ol style="list-style-type: none"> 1. To provide LSWR rundown line into Tk-14 2. To provide LSWR marine line from Tk-14 3. Installation of tank steam heaters and associated piping 4. Installation of local Temperature Indicator (TI) and Thermowell
17)	T-CONDY PROCESSING PROJECT (PHASE 1)	ESSO MALAYSIA BERHAD, PORT DICKSON REFINERY	Esso Malaysia Berhad engaged Chalpoint for the Detailed Engineering services for T-Condy Processing Project (Phase 1) at Port Dickson Refinery, Negeri Sembilan. The process specification covers the installation required to consolidate T1016/T13 as a single absorber with D2070 liquid as lean oil. This installation is part of the T-Condy Project. Consolidation of T1016/T13 as a single absorber and using D2070 liquid as the lean oil has been identified as one of the measures that could increase condensate run. Simulation study by EMRE using PRO/II confirmed that D2070 liquid can be used as lean oil for the absorption of LPG from the crude gas and PF-1 off-gas. The project comprised of three (3) process specifications: <ol style="list-style-type: none"> 1. Consolidation of T16/T13 as a single absorber with D-2070 liquid as lean oil 2. Facilities to de-bottleneck LVN rundown circuit 3. Facilities to operate PF-1 LE unit in crude light ends service / FCV for NHF treat-gas
18)	PROVISION OF FLOW ASSURANCE STUDY FOR LAYANG DEVELOPMENT PROJECT	NIPPON OIL EXPLORATION (MALAYSIA) LTD	The flow assurance study scope of work cover steady state and transient modeling of the Layang production pipeline system and associated interfaces and address the following general areas: <ol style="list-style-type: none"> 1. Initial start-up and production re-start of Layang wells 2. Normal Layang production pipeline operation, turndown capability / limitations and ramp-up constraints across anticipated field life

ITEM NO.	PROJECT TITLE	CLIENT	PROJECT DESCRIPTION
			<ol style="list-style-type: none"> 3. Pipeline shutdown, cool-down and depressurisation 4. System design integrity, liquids management, hydrate management and erosion potential 5. Production pipeline system operability across anticipated field life
19)	CATHODIC PROTECTION ASSURANCE WORK FOR PETRONAS METHANOL (LABUAN) SDN. BHD. (PMLSB) PIPELINE AND UNDERGROUND UTILITIES.	PETRONAS METHANOL (LABUAN) SDN. BHD.	<p>PETRONAS Methanol (Labuan) Sdn. Bhd. engaged Chalpoint for the Cathodic Protection Assurance work for Pipeline and Underground Utilities. The scope of work includes the following:</p> <ol style="list-style-type: none"> 1. Verify test post & anode location, dept and distance form buried pipeline, protection coverage 2. Electrical inspection (SACP & ICCP) 3. Verify availability & location of insulating flange/MIJ 4. Record pipe-to-soil potential at every 2m(NG pipeline & seawater intake). Propose additional test post if required. 5. If additional test post is required, perform DCVG test, or in worst case, repair the damage coating. 6. Specific inspection:- <ol style="list-style-type: none"> a) Close Interval Potential Survey (CIPS) test b) Transformer Rectifier (TRU) inspection c) Interference Testing d) Insulating Flange and MIJ testing 7. To submit comprehensive report endorsed by accredited NACE CP and Corrosion Specialist
20)	DETAILED ENGINEERING WORK FOR ETHANOX INJECTION FACILITIES IMPROVEMENT PROJECT	ESSO MALAYSIA BERHAD, PORT DICKSON REFINERY	<p>Esso Malaysia Berhad engaged Chalpoint for the Detailed Engineering services for Ethanox Injection Facilities Improvement Project at Port Dickson Refinery, Negeri Sembilan. This project includes the following main scope:</p> <ol style="list-style-type: none"> 1. Install OSP 35A (new pump) and OSP 35B (shift and reuse existing pump OSP 33 as spare pump OSP 35B) on new pump foundation. 2. Set up Porta-Feed Tank beside the new pump area and provide concrete platform with spill bund to contain spillage. 3. Rerouting of Ethanox injection line.
21)	PROVISION OF INFIELD PIPELINES DETAILED DESIGN ENGINEERING FOR CENDOR PHASE 2 DEVELOPMENT PROJECT, BLOCK PM304	PETROFAC (MALAYSIA – PM304), LTD.	<p>Cendor Phase 2 project development consist of a Support Structure (CDW-A), a new wellhead platform (CDW-B), a second wellhead platform (CDW-C), Floating Production and Storage Offloading (CDP-A) and Infield pipelines, power and control cables.</p> <p>The FWS fluids leaving the platforms will be transported to the CDP-A in dual multiphase phase 12" NB flexible static flowlines connecting to flexible dynamic risers at CDP-A.</p>

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			<p>There will be 8" NB gaslift / gas injection / water injection rigid pipelines connecting CDP-A and CDW-B and CDW-C. The in-field pipelines detailed design scope include all the rigid (Carbon Steel and CRA Clad) pipelines and risers including the tie-in flange design at both ends.</p> <p>Chalpoint scope of work is the in-field flowlines detailed design.</p>
22)	PROVISION OF ENVIRONMENTAL CONSULTANCY SERVICES FOR SKO PIPELINES AND FACILITIES REJUVENATION PROJECT	OPE (M) SDN. BHD. / PETRONAS CARIGALI SDN BHD	<p>Conduct front-end / conceptual study on assessing options on the improvement of the overall sump and drain system of platforms at PCSB-SKO, in prevention / minimizing the exposure of PCSB offshore facilities to sea water and oxygen.</p> <p>The main objectives are as follows:-</p> <ol style="list-style-type: none"> 1. Assessment of issues concerning existing sump & drain systems 2. Conduct conceptual / front end engineering studies; to develop various possible solutions in dealing with seawater carry over and oxygen ingress, with study options. 3. Design review / challenge session with PCSB after issuance of first Issued For Review (IFR) package 4. Develop a study and a generic detailed engineering scope of work for each acceptable scheme suitable for next activity to perform detail engineering.