

***SAFETY & CRITICAL CONTROL SOLUTIONS
FOR OFFSHORE / ONSHORE
OIL & GAS AND PROCESS APPLICATIONS***

Controls & Electrics



**SINCE
1828**



BOUSTEAD®

Since 1828

Company Profile

1828, a year to remember in Singapore's Corporate History, the year when a young Englishman, Edward Boustead founded a Company that has survived and grown through wars, riots and political upheavals, the birth pangs of separation and successive periods of recession and buoyancy. Trading in natural resources, spices, coconut, tobacco, tin, tea and silk were the core businesses in the early days when Boustead's ships plied the China/Europe routes.

Over the years, many names and brands became synonymous with the Company. These included CADBURY's, JOHNNY WALKER, HENESSEY, LLOYDS, THOMAS COOK amongst others. The Company itself grew and prospered. By the 1900's, the Company that had its roots in Singapore had spread its wings all over South East Asia and Australia and eventually back to the mother country, England. Successive re-structuring resulted in the creation of separate entities in Malaysia, UK and Singapore, carrying the same name, listed on their respective stock exchanges and all major corporations in their own right. Today, the legacy of Edward Boustead continues with the same professional integrity that has stood the test of time.



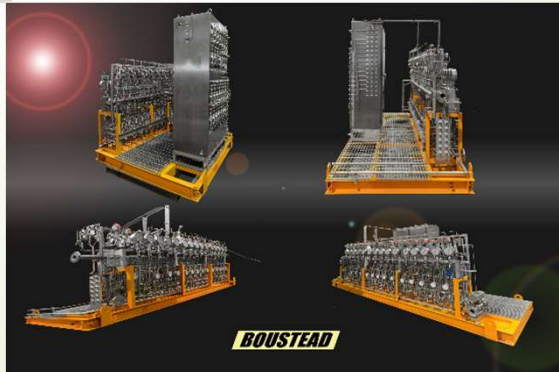
Company Profile

C & E , as Controls & Electrics is better known, commenced operations as a division of Boustead Services Pte Ltd and is primarily involved Real Time Process Control System Design and Implementation for Process Industries and the supply of electrical machines, instruments and accessories. Primary strengths are in the ability to deliver value -added solutions .

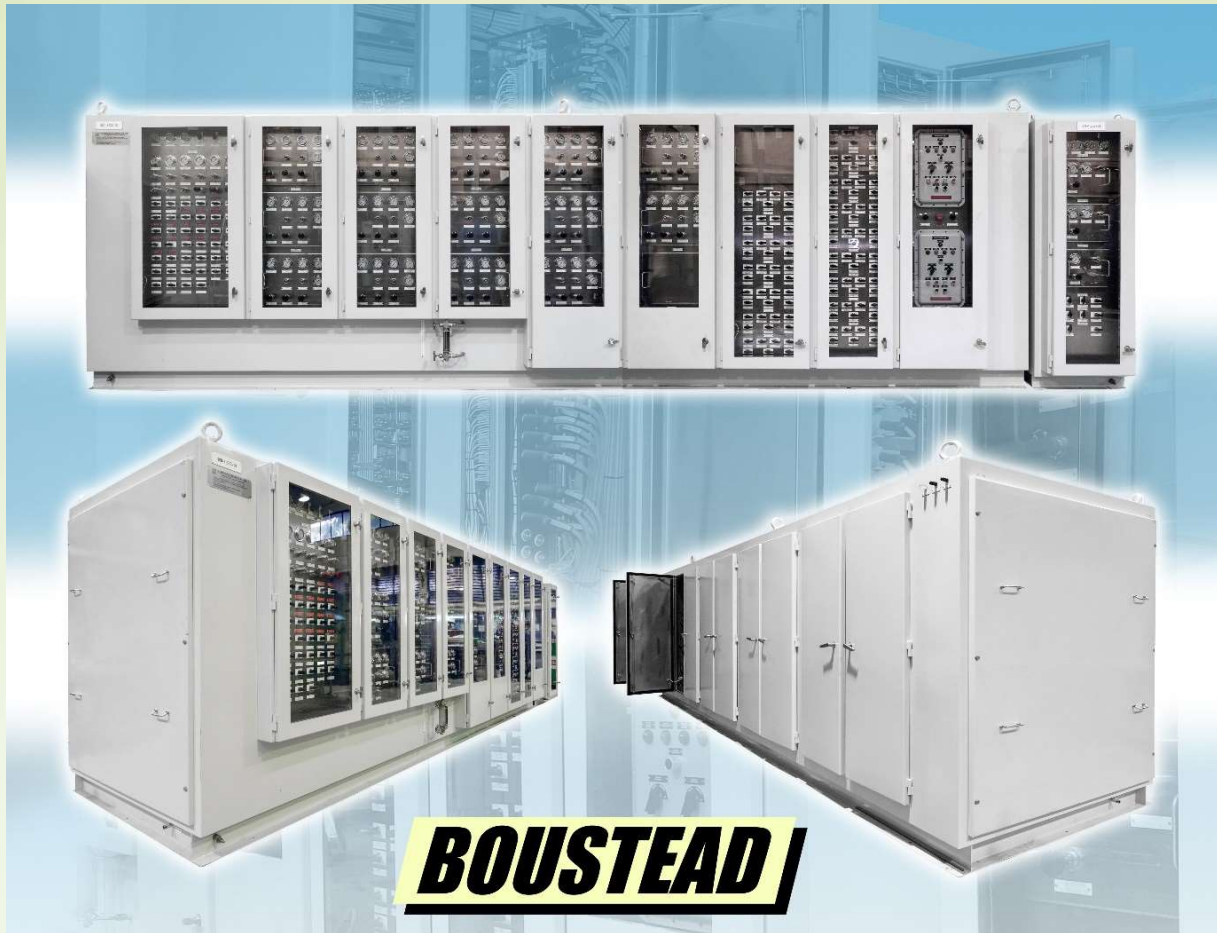


In the process, several products/systems have been developed which are internationally accepted as high integrity control & safety solutions , particularly for the upstream oil and gas industries. The business was built from scratch based largely on the entrepreneurial spirit of its management. The enviable track record that has been built up over the years represents many years of day-and-night toil and the "WE CAN DO IT" attitude that is representative of the true Singapore spirit.

Our Products



Wellhead Control Panels



BOUSTEAD C&E Wellhead Control Panels and Systems monitor vital process safety parameters of a well head platform and provide safe and sequential start-up and shutdown of production wells as per design SAFE charts. Incorporating the know-how acquired over nearly 40 years of design and implementation expertise as well as feedback received from our esteemed clientele, our products are unmatched in quality of design, workmanship, accessibility and ease of maintenance.

Logic operation may be pneumatic (air/gas) or low pressure hydraulic generated within the panel. In line with current trends, and where reliable electric power is available, we offer programmable logic implemented using TUV AK6 (SIL 3) approved hardware/firmware. Wellhead shutdown systems are supplied with integrated or separate stand-alone or skid mounted hydraulic power units (HPUs) complete with redundant hydraulic pumps, accumulators and reservoirs. Facilities are available for remote monitoring and control of critical process parameters and shutdown valves from the process platform complex. Our well proven in-house capability & experience in high integrity electronic systems ensures a one-stop solution for the implementation of advanced well testing & partial stroking features.

Hydraulic Power Unit



The HPU can be integrated in the common section of the panel complete with pneumatic/electric driven pumps, accumulators, reservoirs, thermal and pressure relief optimally sized to provide actuating power to all hydraulically operated shutdown valves.

Alternatively, the HPU can be a separate stand-alone skid mounted unit. Accumulators are available in different materials of construction to suit the environment.

Large HPU systems are designed and manufactured for Sub-sea Wellhead control applications. Installed on FPSOs or Fixed Platforms, these units power the sub-sea hydraulic actuators at pressure as high as 20,000 psig through umbilical as long as 27 kms.

All HPU Systems are ruggedly constructed using only the highest quality materials and components. Pre-installation cleaning and assembly techniques ensure high levels of purity. Completed systems are flushed to minimum NAS 6 requirements and full pressure and function tests are done prior to shipment to ensure years of trouble free service.

Chemical Injection Skid



Controls & Electrics provides state of art technology with engineering solutions for chemical injection and dosing skids. As a reputed system integrator we provide complete solution including Design, Engineering, Fabrication, Testing and commissioning.

Injection systems provided ranges from single to multiple dosing pumps which are pneumatic or electric driven comprising of instruments and valves, mechanical equipment, piping, tanks, and control systems.

Standard Features

Skid Structure: ASME/BS

Over pressure protection:

API 520

Storage Tanks:

ASME sec VIII Div 1 and using Roark & Young stress/strain formulae.

Dosing Pumps : API675

Control System:

Interface with RTU, PCS, ESD systems.

Testing:

EN12079 for offshore.

Fire & Gas Systems



2003 Santiago D. Luib III

From FPSOs and Production platforms to tunnels and buildings, C&E provides fire and gas detection, alarm and protection systems. Using state-of-the-art discrete as well as addressable detectors and transmitters, systems are configured to operate in conjunction with controller cards, addressable fire panels and/or plcs. Where required, we also supply the FM 200 or other extinguishing systems as part of the package.

Fire & Gas Systems are engineered and supplied on stand-alone basis or as part of an integrated ESD and/or Process Control System.

Notable systems in successful operation include the F&G System for Saudi Aramco's ZULUF GOSP-2 Production Complex which, at 1.2 million/barrels per day, is the largest single such complex anywhere in the world . A significant number of FPSOs and production platforms worldwide are also protected by F&G systems designed and implemented by C & E.

Integrated Control & Safety Systems

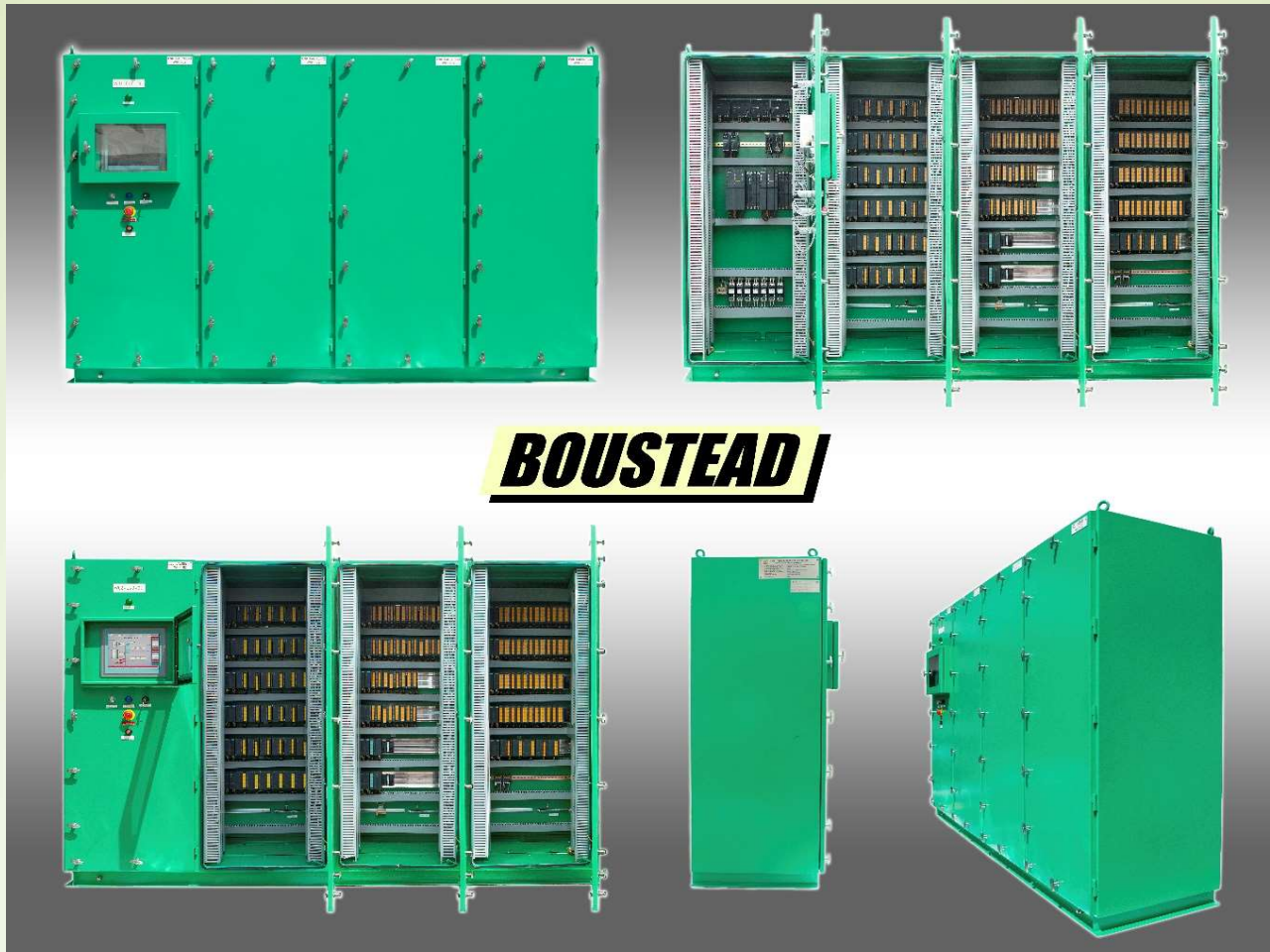


C&E designs, integrates and supplies High Integrity Emergency Shutdown systems (ESD) for mission critical applications such as Wellheads, FPSOs and Production Platforms. Systems are designed to TUV AK6(1002D) requirements with complete redundancy at controller, Power Supply, Communication and I/O.

The system architecture ensures very high levels of availability together with the highest levels of reliability required of safety instrumented systems. Advanced diagnostics (more than 1000 are run every second) enable trouble shooting as well as predictive maintenance down to single I/O channels. Systems are designed to ensure that no single failure will bring the system down and cause production loss while ensuring that no UNSAFE failure will go undetected and endanger plant, equipment or life.

Input testing (open/short circuits) and protected outputs are standard. Sequence-of-Events can be resolved to within 1 or 3 ms depending on the hardware /software platform being used.

ESD Systems



BOUSTEAD

C&E designs, integrates and delivers High Integrity Emergency Shutdown systems (ESD) for mission critical applications such as Wellheads, FPSOs and Production Platforms. Systems are designed to TUV AK6 (1002D) requirements with complete redundancy of controllers, Power Supplies, Communication networks and I/O modules.

The system architecture ensures very high levels of availability together with the highest levels of reliability required of Safety Instrumented Systems. Advanced diagnostics (more than 1000 are run every second) enable trouble shooting as well as predictive maintenance down to a single I/O channel. Systems are designed to ensure that no single failure will bring the system down and cause production loss while ensuring that no UNSAFE failure will go undetected and endanger plant, equipment or life.

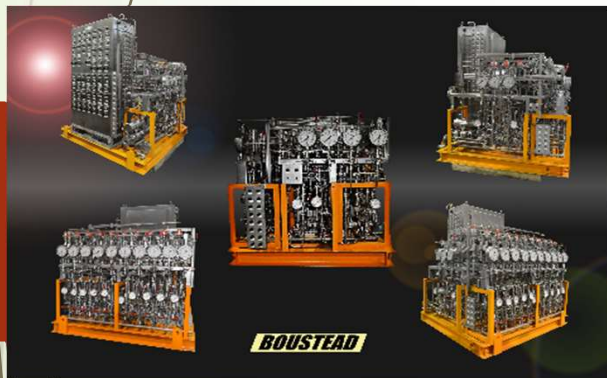
SCADA Systems



A fact that is obvious yet often escapes attention is that in this day and age, there is really not much to choose between one brand of hardware and the other - technologies have evolved to the point where the hardware merely provides the building blocks based on which a system must be implemented. Application know-how and experience of the people that will actually put the system together is therefore of the utmost importance .

C&E, over the last quarter of a century, has designed and implemented simple as well as complex Supervisory Control and Data Acquisition systems for diverse industries. Projects have ranged in size from less than \$100K with as few as 200 I/O to several million dollars with over 20,000 real I/O. Systems have been based on standard plc ,RTU or DCS hardware with off-the-shelf software packages being utilized for the HMI functions. Systems may comprise many remote nodes communicating over cable, fiber optics or via wireless radio.

ONE STOP SOURCE FOR CONTROL & SAFETY SOLUTION



Contact Us

E-mail : sales@bousteadcontrols.com

Web: www.bousteadcontrols.com

SINGAPORE

Controls & Electrics Pte Ltd
30 Gul Drive
Jurong Town
Singapore 629478

INDIA

Boustead Controls & Electrics (India) Pvt. Ltd.
616, Udyog Vihar
Phase V
Gurgaon 122015

SAUDI ARABIA

Controls And Electrics Arabia Co. Ltd
Abdulla Foaud Tower
King Fahad Street
PO Box 257, Al
Dammam 31411

UAE

Controls And Electrics System Manufacturing Ltd
Unit KLP FZ No. 16,
Taweelah, Abu Dhabi,
U.A.E

OMAN

Controls And Electrics LLC
P.O. Box 159,
Postal Code 124,
Al Khuwair, Bousher,
Muscat Governorate,
Sultanate of Oman