



Welcome to the latest newsletter from HAT International, aimed at keeping all our customers up to date with the latest products and developments within our company, as well as some general news on what's going on in the industry. We trust you find it informative and we welcome any comments or suggestions you may have to improve the format.

If you wish to unsubscribe, simply reply at any time with 'UNSUBSCRIBE' in the subject box.

Latest Developments

Orders this month include several UK contracts for our range of **random column packings**, various **replacement internals** for offshore India, additional liquid **anti-motion internals** for an ongoing FPSO order from Korea, and various **polypropylene demisters** for the UK.

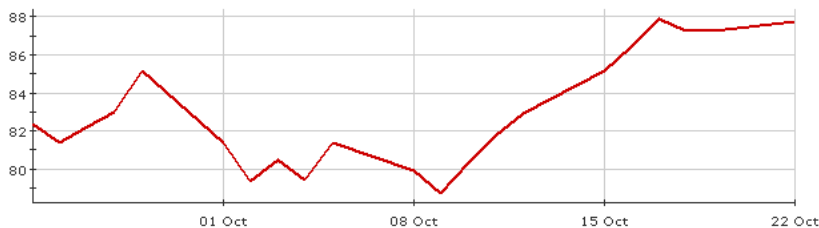
Recently completed contracts include the **offshore installation of trays inside 2 amine columns** in the North Sea, the supply of **gas scrubber internals (inlet distributors and vane mist eliminators)** for various

projects in the UK and Norway, and several **wire mesh demisters** for Saudi Arabia.

Joining us this month in our Newcastle-under-Lyme UK Operations office is **Martin Stockton**, as **Engineering & Quality Manager**, who will be heading our expanding mechanical design team and ensuring HAT continues our tradition of delivering high quality products at very competitive cost.

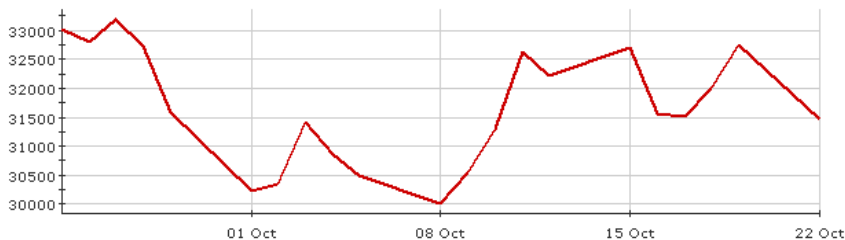
Industry & Market News

West Texas Intermediate Crude Oil \$/barrel



OIL PRICE BREAKS USD 90.....As winter approaches, tensions in Iraq and a weak Dollar contributed to a US light price peak of USD 90/Bbl on 19 October, but OPEC hints at an early review of production

Nickel 3mo Official \$/m tonne



NICKEL PRICE STEADIES.....Trading in the range USD 30 to 33/kg this month, there was nevertheless much volatility as dealers assess possible weakening demand and dollar woes.



United States Dollar - Pound Sterling



DOLLAR SLIPS FURTHER.....The US currency continues to suffer against the major currencies, standing at at USD1.00 = 0.705 Euros and 0.492 GBP (22 October).

Chevron USA Inc has announced plans to build a major gasoline production unit at its refinery in Pascagoula, Mississippi.

Gazprom Russia has confirmed its intention to attract foreign companies for participation in gas and oil projects to be implemented by the state gas group

VCNG Siberia plans to invest 13 billion rubles (US\$521 million) in development of the Verkhnechonskoe oil and gas condensate field in 2008

Eni and NOC Libya establish the foundations for future joint Oil & Gas development covering 25 years

Lurgi S.A. Krakow, Poland, has signed a contract with Grupa LOTUS S.A. (Gdansk) for the construction of a hydrogen plant, a crude oil distillation unit and a vacuum distillation unit.

SONHOE Development UK is planning a 200,000 bbl/d oil processing plant at Teesside. The £2b (US\$4b) facility will upgrade heavy, sour or acidic crude oils into high-quality low-sulphur diesel, petrochemicals and kerosene, and should be complete between 2012 and 2014.

MMC, the Malaysian infrastructure and energy group, has agreed with partner Saudi Binladen Group to build a \$3b aluminium smelter in **Saudi Arabia** with China's Aluminium Corp (Chalco). The smelter is part of the "Jizan Economic City" project, a 117 sq.km area with aluminium, steel and copper processing plants, oil refineries, ports, and fisheries. Located 725 km south of Jeddah, it is a gargantuan 30-year project estimated to cost over \$30b.

Feature

Mechanical Considerations for Vessel Internals

Our feature this month looks at some of the mechanical aspects that should be considered when specifying and purchasing column and vessel internals. There are many factors to be considered to avoid later problems during installation and operation and the following checklist may help:

MATERIAL OF CONSTRUCTION - Should be specified to give a reasonable design life, bearing in mind that the internals are generally bolted and replaceable. Super-exotic alloys may not always be required; but in some cases it may be economic to upgrade material specification due to the relatively higher labour cost element (and lower material cost element) involved in manufacturing specialist internals.

GALVANIC CORROSION - When joining dissimilar materials by bolting, consideration should be given to the possibility of galvanic local corrosion around the joint area and it may be beneficial to specify bolt insulation kits, or alternatively to make the welded support clips/rings from the same material as the internals. This is generally only a problem in 'wet' service where there is an electrically conductive path through the fluid.

EROSION - This should be considered in areas of high velocity, particularly if any solids are present (e.g. separator inlet distributors, cyclones, etc). Additional thickness should be specified.

NORMAL AND DESIGN LOADS - These should always consider maintenance loads e.g. supporting the weight of the maintenance personnel where appropriate, pressure drops when clean and dirty, and possible surges, slugs or abnormal/emergency conditions. Internals can be integrally reinforced or they can use support beams. For high loads or long spans it may be economic to use separate supports in a lower grade material.

TEMPERATURE CYCLING - This can cause fatigue failure or buckling of components if not considered in the design of the support systems. Sliding joints can be made securely, but care needs to be applied when the joint is also gasketed e.g. in some reactor support screen services.

SUPPORT RINGS AND CLIPS - Vessel attachments such as these need to be designed to take the full loads with a suitable safety margin and corrosion allowance where appropriate. Where possible the supports should take the dead load of the internal such that bolting is used for retaining only rather than taking the weight. However, this is not always possible.

BOLTING - All bolted joints should be capable of being fully tightened and secured (for example mesh demisters should be secured by the grid in direct contact with the support lug). In some instances extra security may be beneficial such as when used in vibrating service (e.g. around compressors) or in load cycling applications such as on floating production systems. Here a locking system such as double nutting, lock/tab washers or similar should be employed on critical internals.

WELDING & NDE - Most internals are non-pressure containing and therefore do not fall within coded welding requirements. However, the desired degree of weld procedure documentation should be clearly specified at an early stage as well as the level of NDE required.

INTERNAL MANWAYS - These should be considered and installed where practical to facilitate installation and maintenance. Manways should ideally be removable from either side, with grab-handles as required.

LIFTING & HANDLING - Standard designs will ensure the internals are broken down into sections that can be relatively easily handled, although clearly some items will be heavy and may require lifting lugs or sling points for assisted lift inside the vessel. These should be clearly marked lifting points on drawings so that installation can be well planned.

TRIAL ASSEMBLY - This is a critical activity to demonstrate the fit-up of the various components prior to dispatch. HAT conducts this as a mandatory witness point for all our products, evidenced by photographs.

TOLERANCES - Internals need to be supplied not just within their own manufacturing tolerance, but their design also needs to accommodate potential deviations of the vessel or column (out-of-roundness, diameter deviations, etc). Any known vessel deviations should be identified as soon as possible to allow the internals to be manufactured to suit and avoid last minute modifications. Slotted holes are commonly used on internals to take up such tolerances.



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TRANSPORTATION - Whilst it is common for many internals on new build projects to be installed at the vessel fabrication workshop prior to shipping to job-site, care should always be taken to ensure that the vibrations caused by long road, rail or sea shipments do not result in damage to the internals in transit. Large diameter, thin wall vessels can be particularly prone to this phenomenon and either the vessel or internals should be fitted with shipping braces. Some internals may not be suitable for installation prior to final erection and these should be identified early in the project for logistics reasons.

INSTALLATION AND COMMISSIONING - Should be by a competent crew with experience of installing the internals. The design will normally not allow installation in the incorrect orientation, but if it can happen, it probably will. The installation team should be in possession of all design drawings and installation manuals prior to mobilisation. Photographic records should be taken of the final installation and HAT are happy to review these if we have not carried out the installation ourselves. HAT welcomes being pre-notified of the intended start-up date so that we can respond quickly to any questions that may arise. We also welcome any post start-up comments regarding the installation or performance of our equipment.

Thank you for reading, if you would like more details about the above topics or our product range, please contact us any time using info@hatltd.com