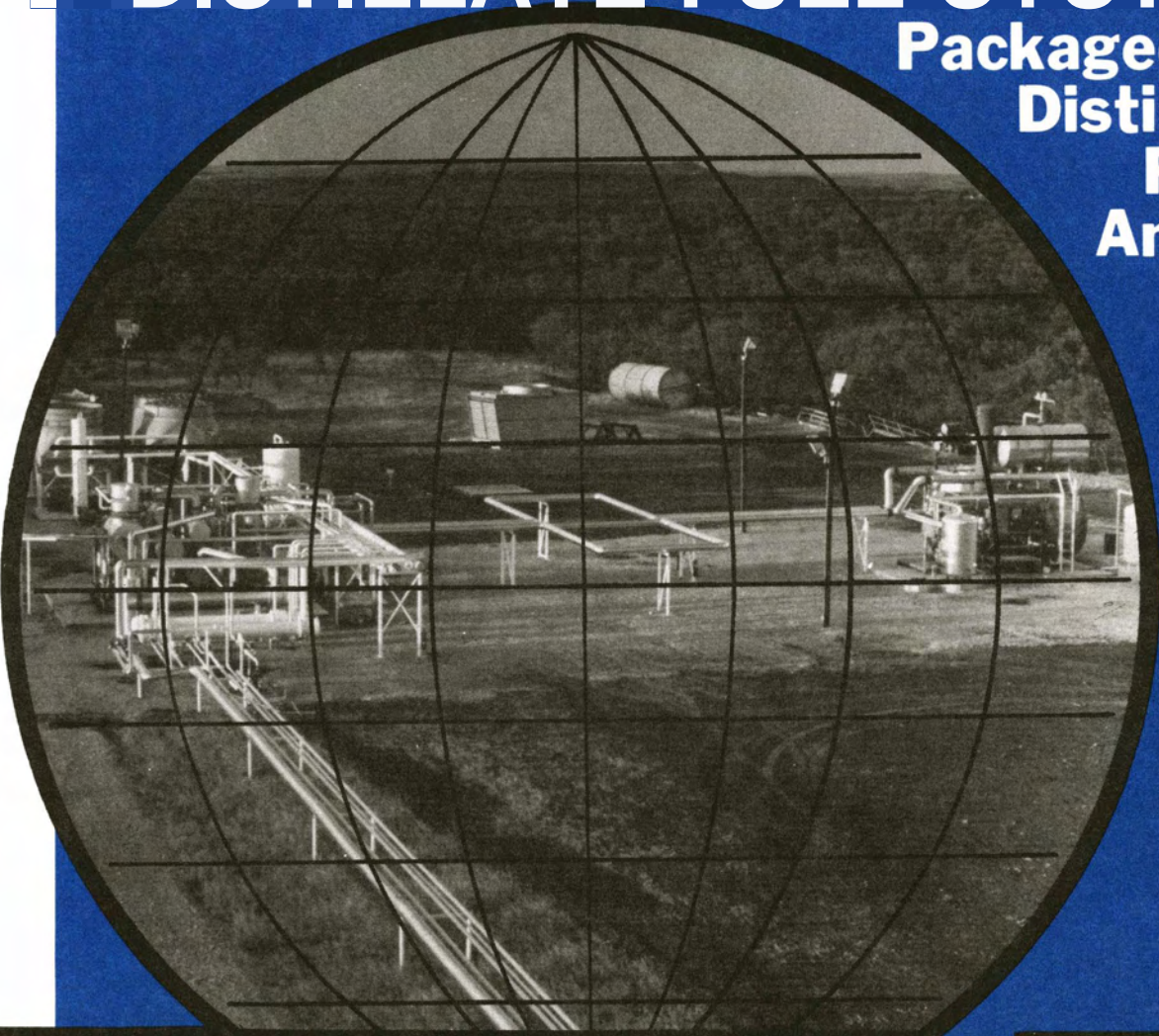


MAXIM

DISTILLATE FUEL SYSTEMS

**Packaged On-Site
Distillate Fuel
Plants Go
Anywhere!!**



EDFS

ON-SITE PRODUCTION OF A DISTILLATE FUEL FOR GAS TURBINES AND DIESEL ENGINES

THE NEED

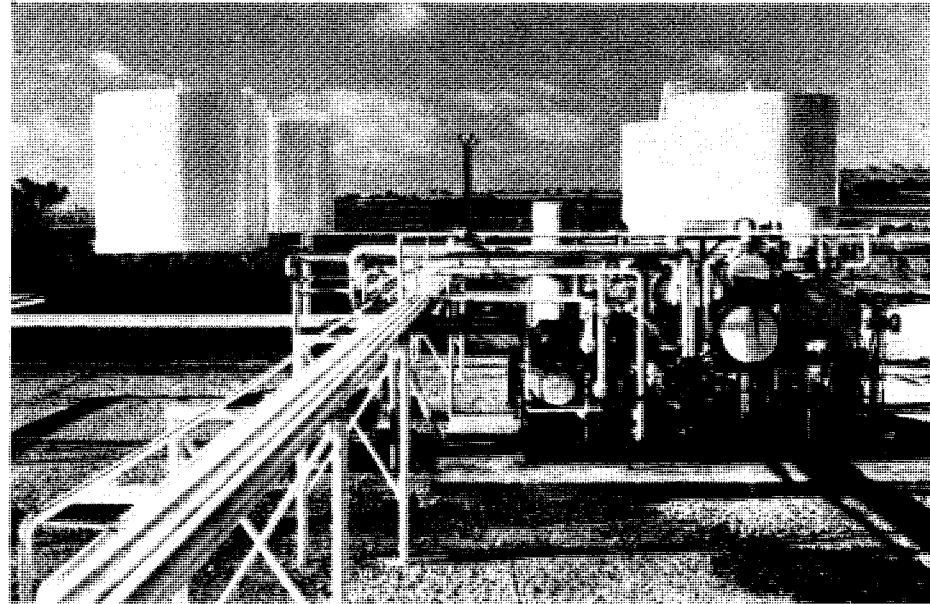
Where a supply of crude oil is available . . . Where there is a requirement for high quality fuel . . . Where transportation of fuel is unreliable or costly . . . Where distillate fuel is not readily available . . .

APPLICATION

- **Remote drilling and production sites**
- **Crude gathering facilities**
- **Pipeline pumping stations**
- **Remote marine terminals**

ADVANTAGES

- **Compact Skid-Mounted**
The Maxim DFS can be shipped to almost any site in the world. The prepped and wired system reduces on-site installation costs.
- **Simplified Arrangement**
A simple two-stage design requires no injections of hydrogen or catalysts for operation. The end point and flash point of the distillate is controlled by maintaining two temperatures within the system.
- **Quick Start-Up**
The process requires minimum warm-up time and stable, continuous operation is almost automatically achieved.
- **Minimum Operator Attention**
A complete control panel, capable of automated operation, requires little or no operator attention. Complete control of the process is at the operator's fingertips. Emergency shut down is automatic.
- **Trouble Free Operation**
Designed for continuous on-stream operation, the DFS incorporates features to reduce maintenance costs and expensive downtime.
- **Low Capital Cost Per Barrel**
Minimum capital investment. Designed and built by craftsmen who know process systems.



THE MAXIM RESPONSE

Thoroughly proven in years of field experience, the Maxim Distillate Fuel System now provides for on-site production of a specification distillate product to operate your diesel engines or gas turbines with a clean and reliable fuel for maximum on-stream operation and reduced maintenance cost.

The Maxim DFS is a practical and economic solution for those remote and often-times inaccessible sites where crude oil is available and the need for a distillate product exists. By producing the required product at the site, unreliable transportation and other logistic cost factors are eliminated, providing for the continuous operation of pumps and power generation equipment and avoiding the necessity for dual fuel engines.

Available in standard sizes the Maxim DFS represents a new generation of packaged process plants. Until now, topping plant designs were miniaturized refineries with associated cracking tower configurations designed to produce a number of products. The Maxim DFS is designed to take a "middle of the barrel" cut and yield a specification distillate.

Field proven, the Maxim DFS employs a simple multi-stage evaporative process which requires little or no operator attention. The basic DFS is supplied as a skid-mounted, packaged system ready for installation at the site, consisting of a process skid, thermol heater, and a fully automated control panel. Depending on site conditions and crude characteristics, additional ancillary components are offered such as desalting equipment, cooling system, and complete interconnecting piping and wiring.

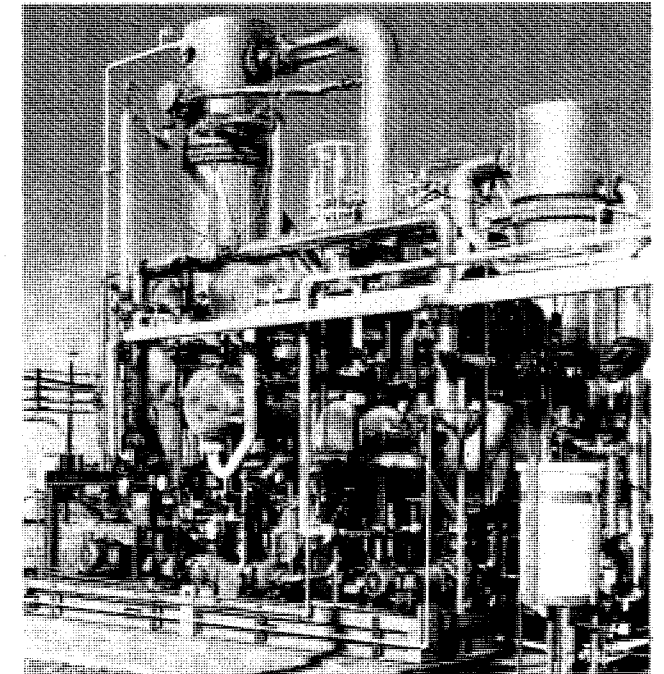
The amount of crude which can be processed and the quantity of the distillate product produced is dependent on the quality and characteristics of the crude feedstock. By maintaining the proper temperatures within the first and second stage vessels, a specification distillate is produced having a controlled end point and flash point. A naphtha stream is produced which can be used as a feedstock to produce gas oils or lighter fractions or can be mixed with the distillate to effectively increase product yield. The heavy ends, or residual, can be used typically as a number 6 fuel oil or directed back to the pipeline.

OPERATION IS VIRTUALLY AUTOMATIC

THE PROCESS UNIT

The packaged process skid contains two evaporative stages and heat reclaiming heat exchangers arranged in a compact, packaged assembly designed to permit transport to almost any site in the world. All vessels and heat exchangers are designed and built to ASME Code, Section VIII, Division I. Pneumatic controls are employed. All pump motors and electrical components meet the requirements of Class I, Division I, Group D for explosion-proof service.

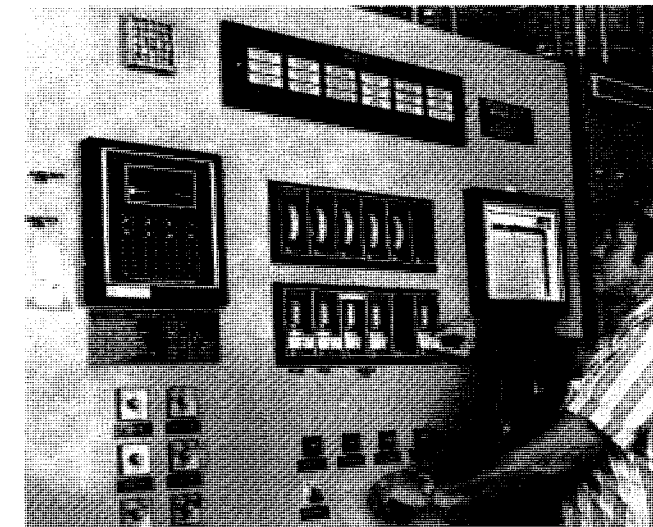
The process skid is shipped assembled, as practical, to minimize field erection costs. All vessels, heat exchangers and interconnecting piping are insulated and jacketed prior to shipment.



CONTROL PANEL

A fully automated control panel with motor control center provides for complete process control. The simplified design permits operation without highly skilled technicians. An annunciation panel, digital temperature read-outs, and a printed log permit the operator to monitor and control the product streams. The free-standing panel is designed with a NEMA 12 enclosure suitable for installation in a remote air-conditioned environment. The panel is available with electric or pneumatic controls, depending on site conditions and customers' preference.

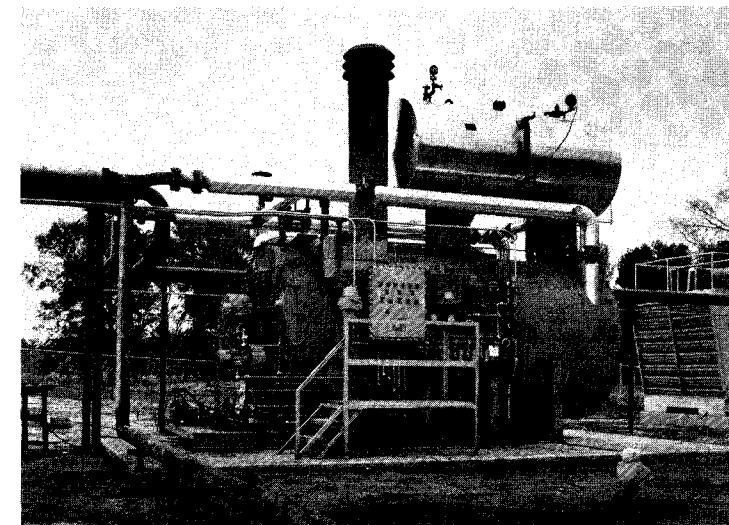
The system is designed for automatic operation with manual start-up and shut-down sequences. Emergency shut-down is automatic with all controls in a fail-safe mode. Process control is maintained by the operator. Adjustment of the process, if required, is made at the control panel. No control adjustment is required at the process skid.



HEAT SOURCE

Heat is supplied to the process by the thermol heater skid. The thermol heater is a horizontal liquid tube heater, supplied as a packaged system, complete with expansion tank and controls. The burner will fire almost all types of gas or fuel oil. Heater construction is designed for offshore use with all electrics designed for explosion-proof service.

An intermediate high transfer rate heating fluid is used to provide ultimate temperature control within the system. Design of the Maxim DFS eliminates costly maintenance and downtime associated with coking of the vessels, common to direct fired designs.



THE MAXIM DISTILLATE FUEL SYSTEM

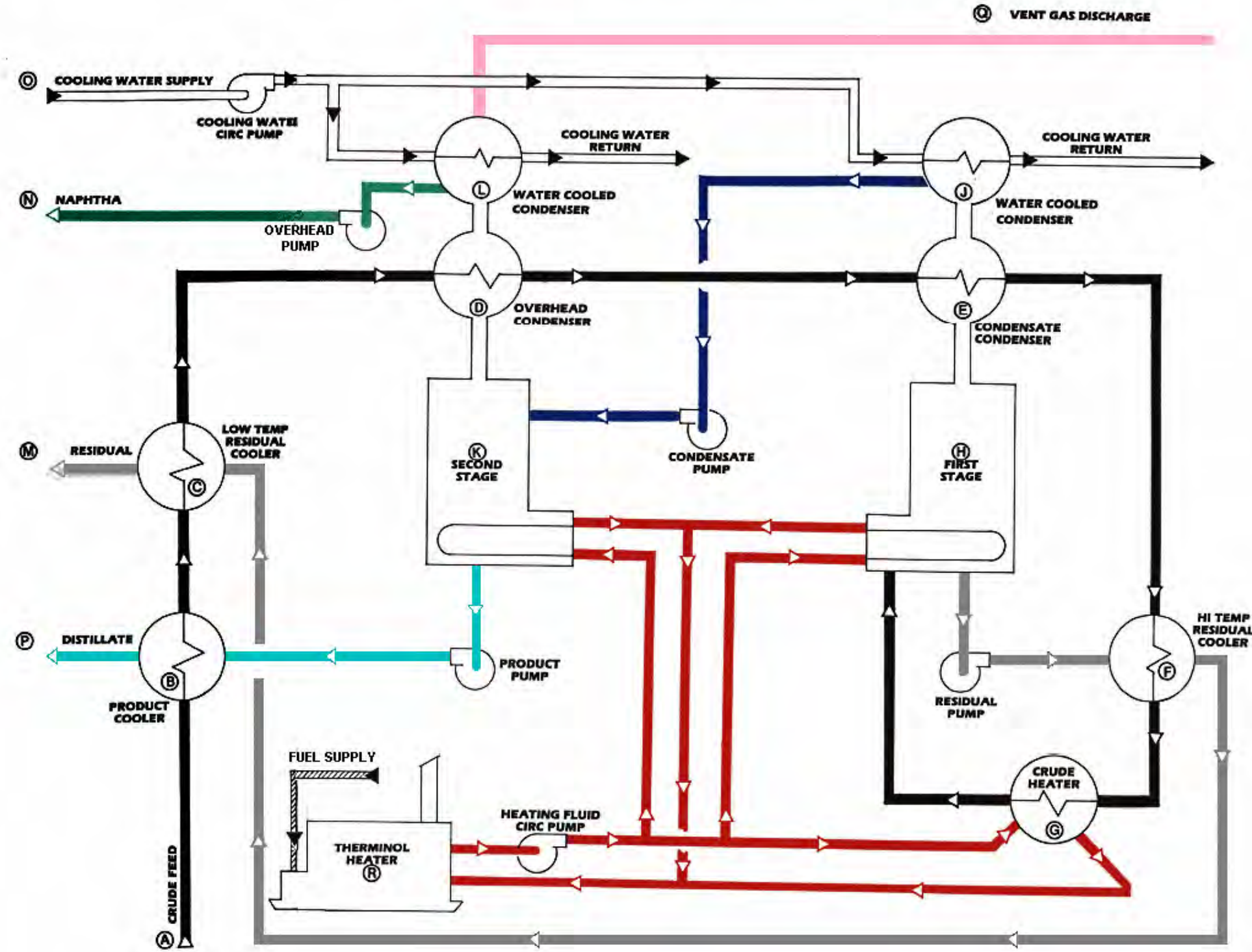
Crude oil (A) is introduced into the Distillate Fuel System through a series of heat reclaiming exchangers (B, C, D, E, and F), and is heated to a preset temperature controlled by the crude heater (G). The heated crude then enters the first stage vessel (H) where additional heat is added and the two phase mixture is allowed to separate the vapor from the heated crude liquid.

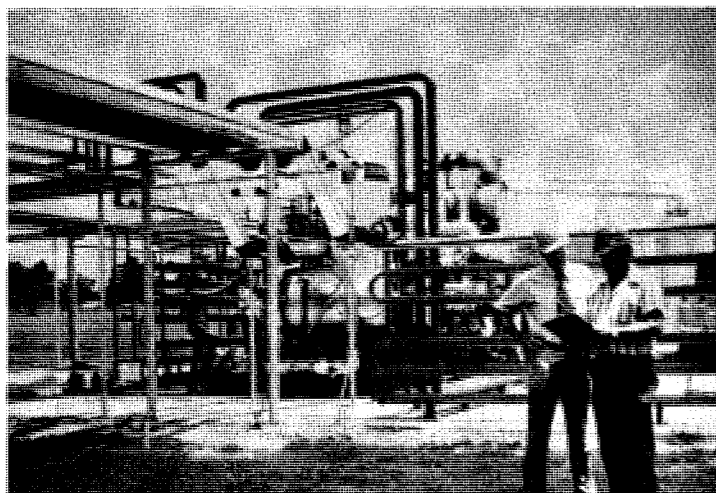
The remaining crude (or residual product) is pumped from the first stage vessel through the residual coolers (F and C) becoming partially cooled by giving up its heat to the incoming crude oil. The residual (M) is then directed to storage or returned to the pipeline. The separated vapors from the first stage vessel are partially condensed in the condensate condenser (E) with the balance being condensed in the water cooled condenser (J). The resultant condensate is collected and pumped to the second stage vessel (K) where it is further processed. Heat is applied to the second stage vessel where the light ends (overhead) are vaporized and condensed in the overhead condenser (D) and the water cooled condenser (L). The overhead is then collected and pumped out as a naphtha product (N) to storage or can be processed further as required.

The remaining liquid (distillate) in the second stage vessel (K) is pumped to the product cooler (B) where the distillate product (P) is cooled and directed as required to storage. The distillate is constantly monitored through fail-safe instrumentation to insure that the product is a clean fuel and complies with the predetermined flash point and fuel specification.

Auxiliary cooling is required to achieve thermal equilibrium. A supply of cooling water (O) is required to effect condensation within the two water cooled condensers (L and J). The cooling system recommended is dependent on site conditions and availability of a source of acceptable water. A cooling tower, or closed loop fin-fan cooling system, can be employed to provide required cooling and to dissipate heat. Alternate cooling with sea water or a clean supply of lake or river water can be considered if available. Thermal energy is supplied to three points within the process skid. A separate skid-mounted therminol heater package (R) is provided as part of the Maxim Distillate Fuel System to supply heat to the crude heater (G) and the first and second stage vessels (H and K). An intermediate high temperature heat transfer fluid is used to provide ultimate temperature control to the system and eliminate coking of the vessel. The heater package can be fired with any of the three products (M, N, and P) or any available fuel or natural gas.

Vent gas (Q) is released from the system. The quantity and quality is dependent on the crude feedstock characteristics and the ambient temperatures and cooling system employed. The vent gas may be flared or collected and further processed. In some instances, the vent gas may be used as a supplementary fuel to fire the therminol heater. The process is designed to maintain a predetermined temperature within the first stage vessel (H), thus controlling the end point of the distillate product (P). The flash point of the distillate (P) is established by the operating temperature of the second stage vessel (K). Temperatures and flows are monitored and controlled from the control panel and can be varied by the operators to provide a distillate product to conform to the customer's specifications.





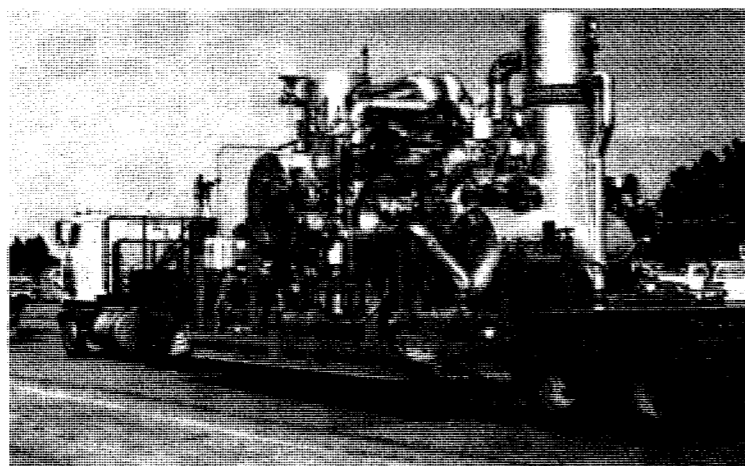
COMPLETE TECHNICAL SERVICES ARE OFFERED

Maxim engineers are prepared to provide engineering and technical expertise in all phases of planning, construction and operation. Qualified personnel are available to conduct site surveys, recommend and prepare custom layout drawings, supervise installation, and provide complete training of local personnel in the operation and maintenance of the Maxim Distillate Fuel System. "After the sale" service is an integral part of each contract to insure continuous on-stream production at maximum efficiency. Actual operating conditions and product requirements are reviewed to obtain optimum operating parameters.

PACKAGED DESIGNS

The Maxim DFS is supplied as a packaged skid-mounted system all piped and wired ready for installation. The rugged design of all components results in a compact assembly which permits over-the-road and ocean shipment to almost any location. No tower erection is required, resulting in minimum on-site erection, labor and material costs.

Installation is limited to locating the skid-mounted assemblies on a suitable pad and installing the interconnecting piping and instrumentation wiring.



OPTIMUM PRODUCTION

Designed to produce a specification distillate with a naphtha stream and a residual product, the Maxim DFS offers the flexibility to produce a distillate product to satisfy the customers' requirements. Maximum yields are established with almost any sweet crude source, permitting the operator to select the end point and flash point of the required distillate product. The residual produced can be marketed as a number 6 fuel or returned to the pipeline if no market exists. Depending on the customers' requirements, the naphtha can be further processed or blended with the distillate to produce a light distillate fuel.



CRUDE FEEDSTOCK REQUIREMENTS

Crude oils vary throughout the world. The characteristics and quality of each crude must be reviewed to determine the quantity of feedstock which can be processed. Production rates will also vary and can only be ascertained after the crude assay and distillation data is reviewed.

The capacity and operating parameters of the Maxim DFS are based on a clean and constant supply of a sweet crude feedstock. The crude should contain less than 10 PTB salt content. Desalting equipment is recommended for those crudes where excessive amounts of salt may be present. Water content is not to exceed 1/2 percent.

STANDARD DESIGNS ARE TAILORED TO EACH INSTALLATION

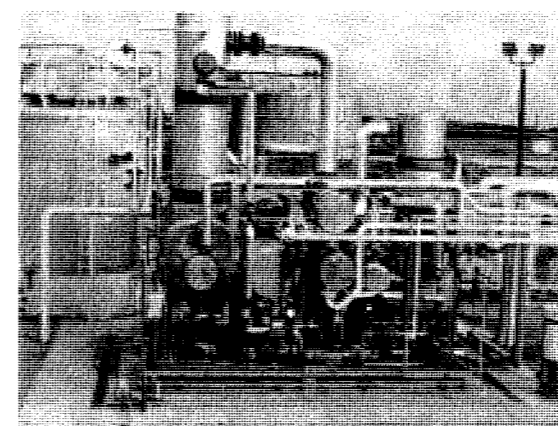
Whether operating with heavy or light crudes, the standard Maxim Distillate Fuel System provides for maximum throughput and optimum product production.

TWO STANDARD MAXIM DFS UNITS ARE OFFERED

Model	Bbls. Per Day Crude Charge	Bbls. Per Day #2 Distillate	Bbls. Per Day Naphtha	Bbls. Per Day Residual
DFS-4	2,000	600	600	800
DFS-10	5,000	1,500	1,500	2,000

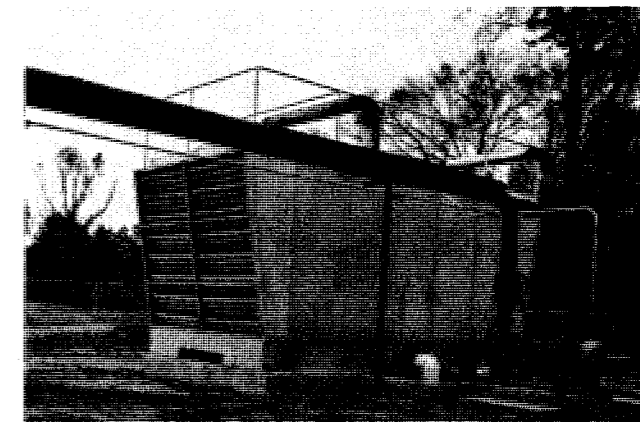
The process rates shown are typical and represent an average operating condition. Charge rates and production streams will vary depending on the characteristics of the crude feedstock. A review of the crude analysis and distillation data is required to establish the anticipated operating parameters.

COMPLETE SYSTEM INTEGRATION



Ancillary components are offered to provide a completely integrated system. When required, desalting equipment may be necessary to provide for continuous on-stream operation. Experienced Maxim engineers can recommend the optimum desalter design to reduce the salt content within acceptable limits.

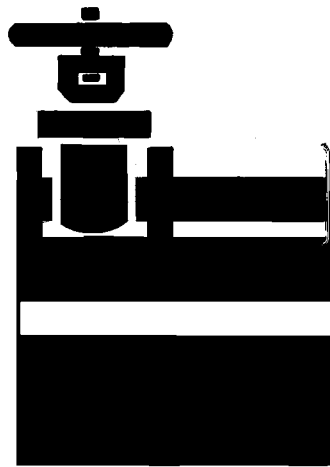
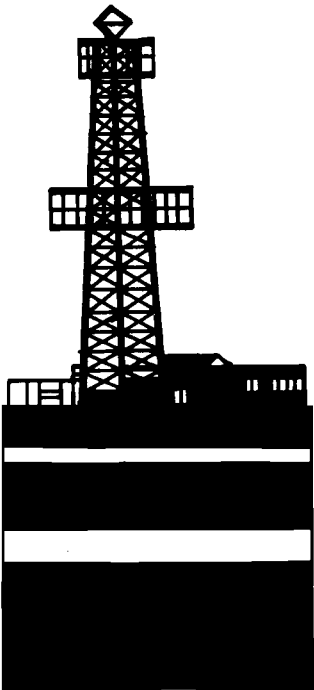
A cooling system is required to dissipate the thermal energy and sustain operation. Depending on site conditions, anticipated ambient temperatures, and availability of a clean water supply, a cooling tower, or closed loop fin-fan cooler may be considered. Maxim engineers are prepared to review and recommend the best system compatible with the purchaser's requirements.



MAXIM PRODUCTS INCLUDE

Distillate Fuel Systems
Marine Evaporators
Land Based Evaporators
Reverse Osmosis Systems
Industrial & Marine Silencers
Heat Recovery Equipment
Catalytic Silencers
Heat Exchangers

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