INTEGRATED CONTROL SYSTEM

TOMORROW'S TECHNOLOGY TODAY...

Frank's ***Integrated Control System***, better known as the ***ICS***, is an optional feature of the Data Trek computer system. The ***ICS*** enables the technician to program the computer to precisely control the speed in which the connection is made up or backed out, the amount of torque to be applied to the connection, and the amount of time torque is held on the connection.

Precise control of the power tong eliminates the operator irregularity in the make-up process. The ***ICS*** will not allow the tong to be rotated until the technician releases control of the hydraulic power supply. The computer is then in control of the power tong until the make-up is completed.The ***ICS*** is particularly useful in the pulling of high interference connections. The ***ICS*** controls both the rapid release of high bearing pressures in metal-to-metal seals during back-out and rapid build up of tong RPM. This prevents elastic yielding of the pipe material and virtually eliminates galling.

The Data Trek computer used to run Frank's International's ICS system.

Absolute Tong Control....

After Stabbing: The tubular speed is gradually increased by the computer until the required RPM is reached. If the torque exceeds a preset safety limit, the process halts. This protects the connection from excessive torque during a vulnerable stage of the make-up process.

Calibration: The computer controls the RPM at the desired value until a preset torque, which is below reference torque, is reached. At this point, the make-up is interrupted in a controlled manner to enable gear changing (if necessary).

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After Gear Change: When the gear change has been completed, the make-up is continued. The computer controls the gradual acceleration of tubular RPM until the new low gear RPM setting is reached. The computer then controls the RPM until the shoulder point is reached.

Shoulder Point: At the shoulder point, tests are conducted to determine if the make-up conditions are within preset limits. If these tests are acceptable, the make-up is allowed to continue. Otherwise, the make-up is aborted in a controlled manner. This minimizes the risk of damaging the connection.

Approach to Target: To avoid overshoot of the target torque, the computer decreases tubular RPM as the torque value approaches the target make-up value. When target torque is reached, the computer can either terminate the make-up with a controlled release of the torque or go into torque hold mode.

Torque Hold: Once target torque is reached the computer continuously controls torque at a constant preset level for a preset time period. When this period expires, the torque is released in a controlled manner. The same benefits of computer control used in make-up of tubulars can also be used to great effect on breakout.

Breakout Mode: It is important to control the breakout speed as the connection rotates at high torque to avoid galling. Frank's Integrated Control System does this with very high precision. The speed demand is gradually increased from zero to a preset limit and torque is allowed to build up slowly. Rigid control of RPM prevents rapid release of stored energy, thus avoiding galling.

Selectability: All the features may be selected or adjusted to suit the individual needs of the customer.

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