

Coiled Tubing Operations Support (CTOS)

COMPREHENSIVE TECHNICAL SUPPORT FOR COILED TUBING OPERATIONS

- CT job design
- Evaluate bid tenders and proposals
- Determine suitability of projects for CT
- Post-job analyses and investigations
- Data acquisition and analyses
- Specifications, manuals and guidelines
- Research and testing
- Training

NOV CTES is uniquely equipped with experienced engineers and state-of-the-art software to provide comprehensive technical support for your CT operations. We can add value to each CT operation by maximizing your chances for success. Off site, NOV CTES can design your CT job or help you optimize an existing job design. On site, NOV CTES can support execution of the job design with technical guidance or up-to-the-minute revisions to the design.



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SOFTWARE TOOLS:

With the aid of our powerful Cerberus™ software, NOV CTES engineers can design your CT job to optimize the performance of a specified CT string or design the most appropriate string for a given job. The Cerberus suite of programs includes the following:

- **Orpheus™** - CT forces and buckling — NOV CTES engineers use Orpheus to calculate drag and helical buckling, determine the maximum setdown weight and overpull at a specified depth, and estimate the surface weight as the tubing runs into and out of the well.
- **Hercules™** - CT operating limits — NOV CTES engineers use Hercules to calculate the CT operating limits of burst and collapse pressures and maximum axial forces.
- **Hydra™** - CT hydraulics performance — NOV CTES realizes the critical nature of designing CT operations to deliver a specific hydraulic performance. Hydra allows our engineers to calculate and monitor the pressure and flow rate of fluids at any location in the CT and wellbore.
- **Reel-Trak™** and **Achilles™** - CT fatigue management — NOV CTES engineers use Reel-Trak with its sophisticated fatigue model, Achilles, to design jobs in a way that will prolong the useful life of your CT string.

OPERATIONS SUPPORT:

- If you are planning a new well for CT drilling or intervention, NOV CTES can evaluate its suitability for CT operations and suggest refinements to the well's path or completion that would improve your chances for success.
- Should a job develop problems, NOV CTES can work with your personnel as an impartial third party to diagnose the source(s) of the problems and recommend a remedy. We have the expertise and resources to analyze operations data, investigate hardware failures, and evaluate actions taken by personnel on the job. NOV CTES can help you improve both the quality standards and the procedures applied to your CT operations
- If you are an oil company seeking a qualified service company to provide CT services, NOV CTES can assist your search. Our experienced staff can write bid specifications and qualification questionnaires, design evaluation schemes, and develop audit criteria.
- If your service company is a candidate for a contract, NOV CTES training and guidance can improve your chances for meeting the selection criteria.

- NOV CTES has conducted numerous successful joint industry and contract research projects on a wide spectrum of CT technology problems. We are eminently qualified to assist you with your research and testing projects ranging from small-scale lab experiments to full-scale field tests.

These sophisticated tools help CTES engineers to analyze each CT job for sensitivity to:

- Well path tortuosity or doglegs
- Wellbore geometry
- Wellbore friction
- Maximum working depth
- BHA size and weight
- Internal wireline (cable)
- CT diameter and taper design
- CT material selection
- Setdown weight and overpull
- Fluids inside and outside the CT
- Pressure inside and outside the CT
- Total string weight

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