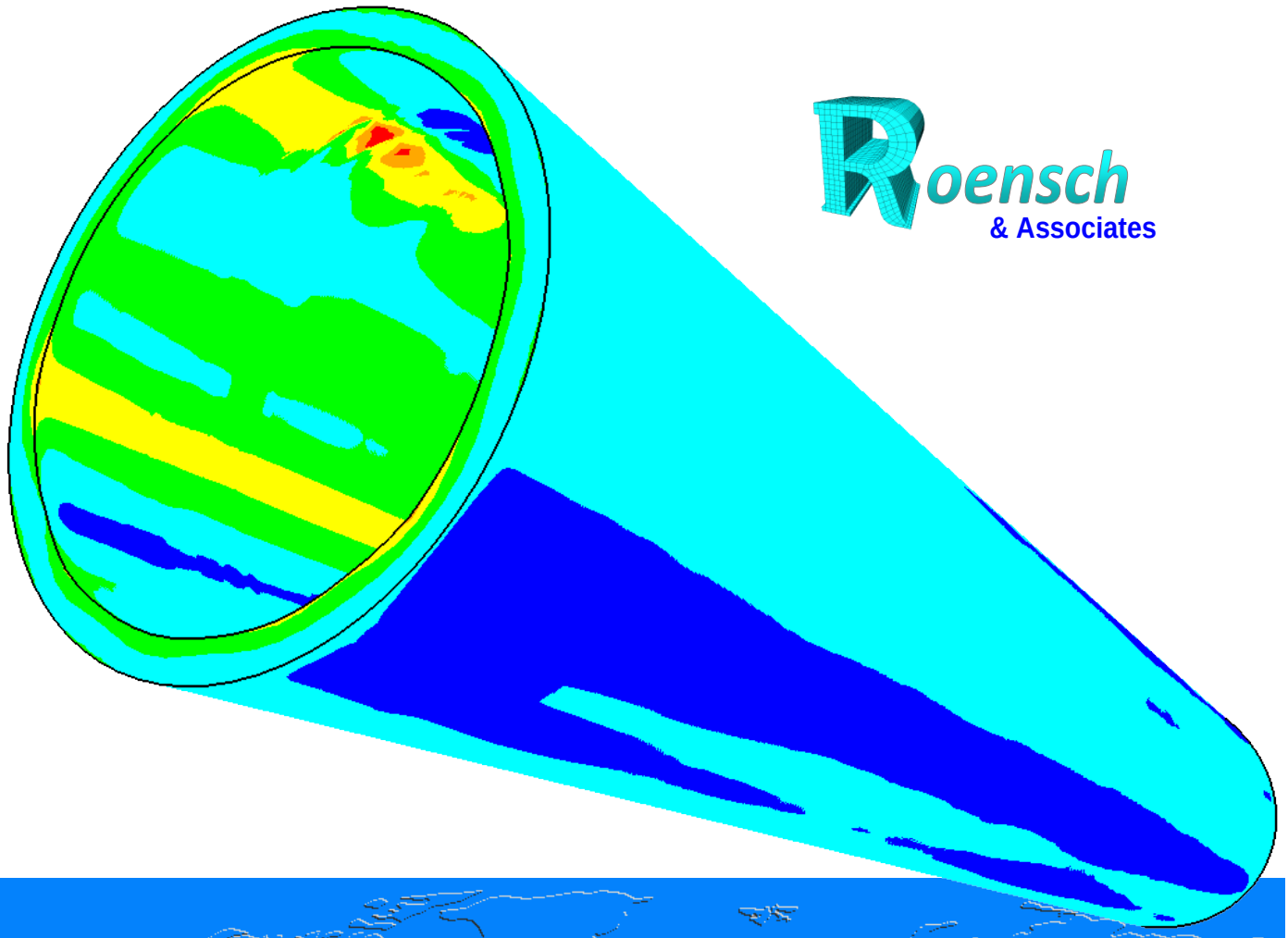
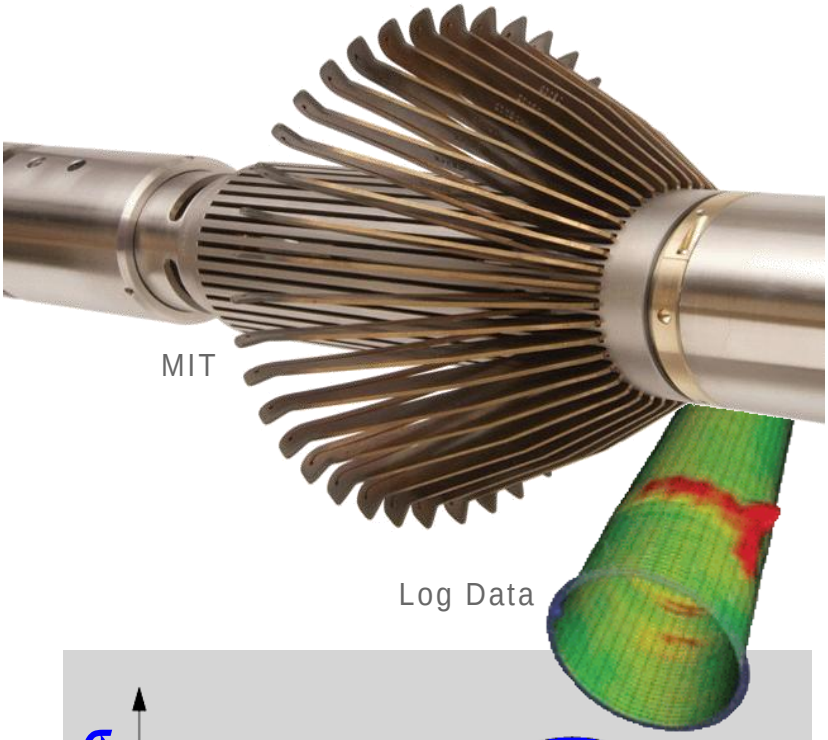
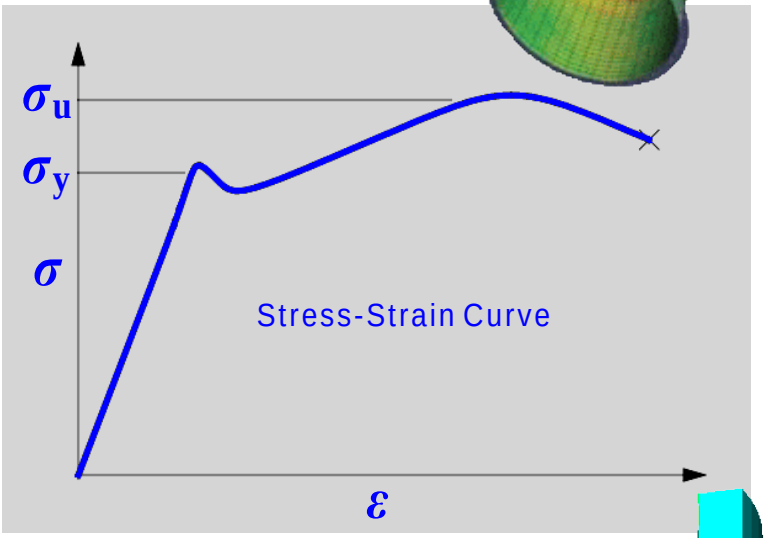
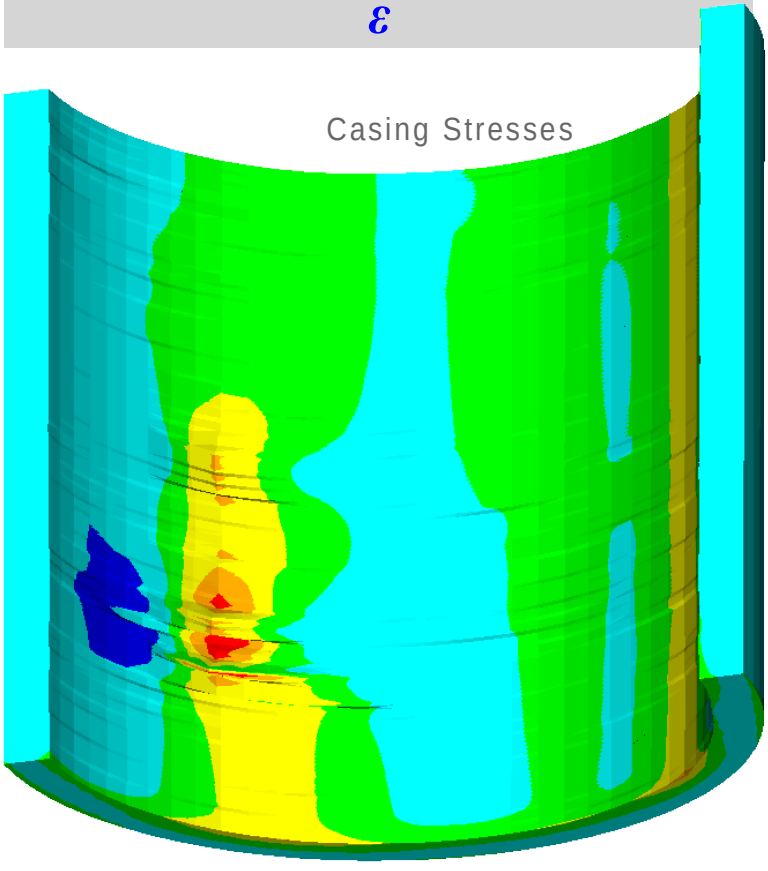


Roensch
& Associates

leveraging Cased Hole Log Data







Investment

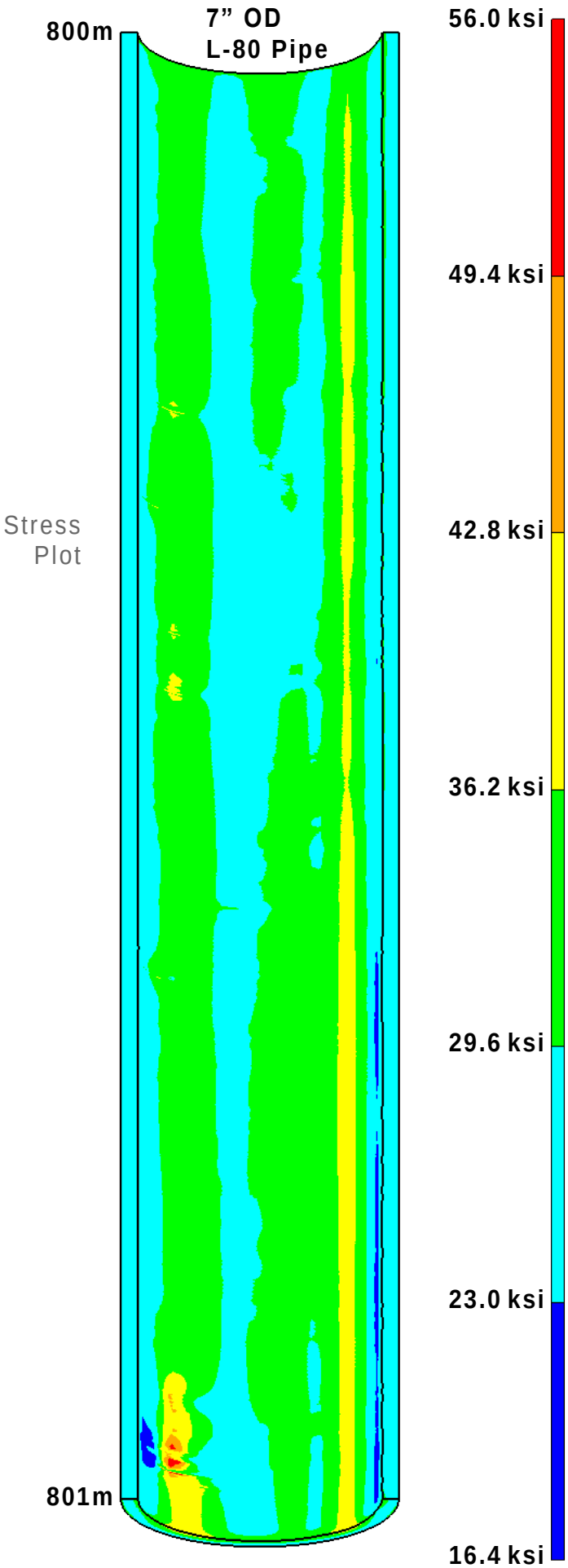
LEVERAGING YOUR DATA

You've invested in the use of downhole tools to measure and log your casing integrity, to assist you in planning remedial work and in preventing catastrophic casing problems. Casing damage can be costly, in terms of lost production, repairs, environmental pollution or accidents. ***Estimating what to repair when is key in reducing downtime and maximizing field production.***

There are various visualization tools to graph the log data and produce 3D views of the casing surface. Plotting the geometry of the casing provides a lot of information, ***but it does not provide an indication of the remaining casing strength.*** Knowing where the stress levels in your casing lie on the material's stress-strain curve estimates your factor of safety relative to the yield strength.

Reviewing the log data allows a determination of which damaged areas may be critical to casing integrity. We use your multifinger imaging tool (MIT) data to prepare finite element models of these critical sections. We work with you to quantify the loads these sections of casing will be subjected to during your phases of operation, such as production, packer unsetting and recovery. ***We apply finite element analysis (FEA) to provide you with color plots of the estimated stresses the casing will experience during these phases.*** You'll receive stress plots estimating the local factor of safety relative to the yield strength and tensile strength of the casing material.

We bring to the table 30 years of FEA experience and provide a unique solution to help you characterize your well casing and increase profitability.



WHAT WE NEED FROM YOU

a. Confirm that the multifinger imaging tool (MIT) data is measuring the inner casing surface, i.e. that scale buildup is not present.

b. Confirm that the outer pipe diameter has not been significantly reduced by corrosion. If significant corrosion exists, we will need an estimate of the lost thickness, if known, or a magnetic thickness tool (MTT) log file.

c. Your multifinger imaging tool (MIT) LAS file may be sent to us by email or FTP.

d. If you have downhole camera images, we would like to review them.

e. Identify the critical damaged areas. We recommend identifying the worst 10m of casing in each 500m of depth.

f. Complete our contract and provide your purchase order.

Value

Across the spectrum of onshore wells to deepwater rigs, daily rates can be measured in thousands of dollars to many hundreds of thousands of dollars, and a well can cost millions of dollars to hundreds of millions of dollars. Investing in leveraging your cased hole logs to provide pipe stress estimates is sound engineering and good business practice.

WORLDWIDE SERVICES

We provide well pipe finite element analysis (FEA) services worldwide. We receive your log data electronically and deliver your results report in PDF format.

EXTENSIVE EXPERIENCE

We have 30 years FEA experience. In addition to analyzing oil field equipment, we have applied FEA to fuel plant piping, wind turbines, robots, heavy equipment such as earth movers and rock crushers, high-precision machining equipment, various medical products, a vast array of vehicles including aircraft, marine, automobiles, trucks and motorcycles, and aerospace projects including the International Space Station.

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Brochure LCHLD 07/2011