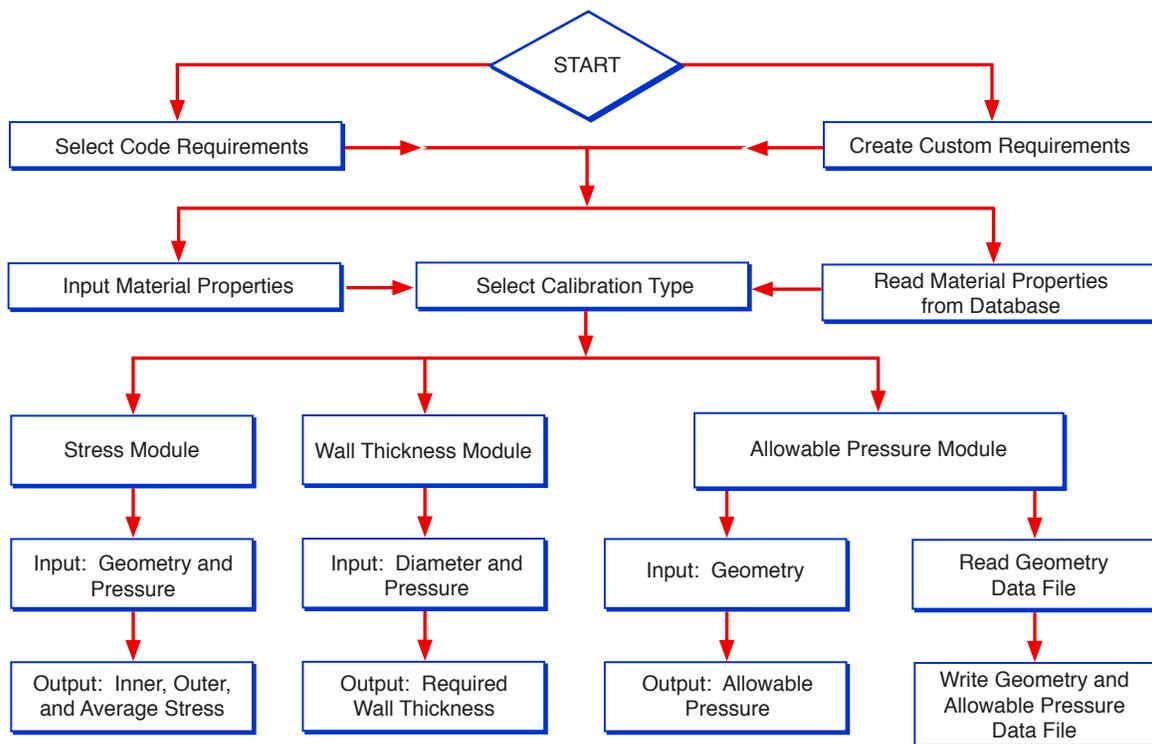


# Technology Opportunity

## Information Technology

# Piping Stress Analysis Software

The National Aeronautics and Space Administration (NASA) seeks to transfer the NASA-developed Piping Stress Analysis Software technology to companies needing a quick, easy-to-use, and efficient method of calculating pipe stress. Current methods used for piping stress analysis tend to rely on basic formulas and a hand calculator or on complex software packages that are often difficult to use for even simple cases. In view of this, the John F. Kennedy Space Center (KSC) has developed a utility that calculates the stress, the working pressure, or the required pipe wall thickness in a simple, straightforward manner. The Piping Stress Analysis Software offers individuals and companies an opportunity to use a product that is more powerful and flexible than traditional paper and calculator techniques and easier to use than most of the currently available software packages.



## Potential Commercial Uses

- Aerospace industry
- Petrochemical industry
- Nuclear and conventional power plants
- Consulting engineering firms

## Benefits

- Ease of use and flexibility: The program is smaller, easier to use, and more flexible than commercially available packages.



## The Technology

This software calculates the stress, working pressure, or the required pipe wall thickness for a given application. The program allows the user to select a specific material from a database of commonly used materials or to create a customized database for an unlisted material. The program analyzes pipes according to several sets of requirements, such as the ASME/ANSI B31.1 and B31.3 piping codes and the JIC hydraulics code. Both standard and SI metric versions are available. This utility is based on the well-established theory of elasticity, the strength of materials, and the work of the industry piping standard committees. It utilizes the Lamé equation, standard piping code equations, and custom-derived elastic-plastic equations for high pressures. This program is easier to use and more compact than other commercially available packages of its type, thus filling a need for many users. It is also more flexible since it can calculate the stress level in a given pipe at a given pressure, the minimum pipe wall thickness, or the maximum allowable pressure. The software was originally written in FORTRAN 77 and ported for a DEC VAX computer running the VMS operating system. It has subsequently been recoded in C language and will now run in DOS, Windows, and Windows NT. It is possible to port this software for microcomputer use.

## Options for Commercialization

This technology is part of the NASA Technology Transfer Program. The program seeks to stimulate development of commercial applications from NASA-developed technology. The software was designed and tested and is in use at KSC. This technology is available at no cost to U.S. companies and U.S. citizens with a U.S. mailing address.

## Contact

If your company is interested in the Piping Stress Analysis Software technology or if you desire additional information, please reference case no. KSC-11692 and contact:

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### Commercialization Checklist

- Patent Pending
- U.S. Patent
- Copyrighted
- Available to License
- ✓ Available for no-cost transfer
- Seeking industry partner for further codevelopment