

# 661PRO v2.1

**661PRO** performs a finite element analysis of nozzles on rectangular header boxes for air-cooled heat exchangers per API 661. Several types of nozzles are allowed, including circular, oblo-swaged, tapered and nozzle-reinforced (barrel). The tubesheet area stresses can be approximated by specifying the number of holes, pitch, tube diameter and thickness, effective elastic modulus and effective Poisson's ratio.

The information and loads for up to five nozzles can be entered; however a single nozzle will be modeled and analyzed using Finite Element Analysis. The loads from the other nozzles will be combined with the modeled nozzle and applied to the tubesheet. Loads from all the nozzles in the header box will combine to produce a stress at the weakest area of the header box, which is the tubesheet.

## WHY SHOULD I USE 661PRO?

SIF's and flexibilities from a nozzle on a square header box may affect the load distribution in a piping system. Many pipe stress analysts model the square header boxes and nozzles as rigid elements. In reality, the nozzle stiffnesses can play a large role in the distribution of loads along the entire piping system. The gain in flexibility may result in reduction of loads at supports and other components.

Compliance with allowable loads from API 661 is required by many companies. 661PRO automatically adds the API 661 allowable loads to the nozzle in the square header box. The local stress analysis is compliant with ASME Section VIII Division 2 Part 5 – Design by Analysis section, which is a widely accepted code.

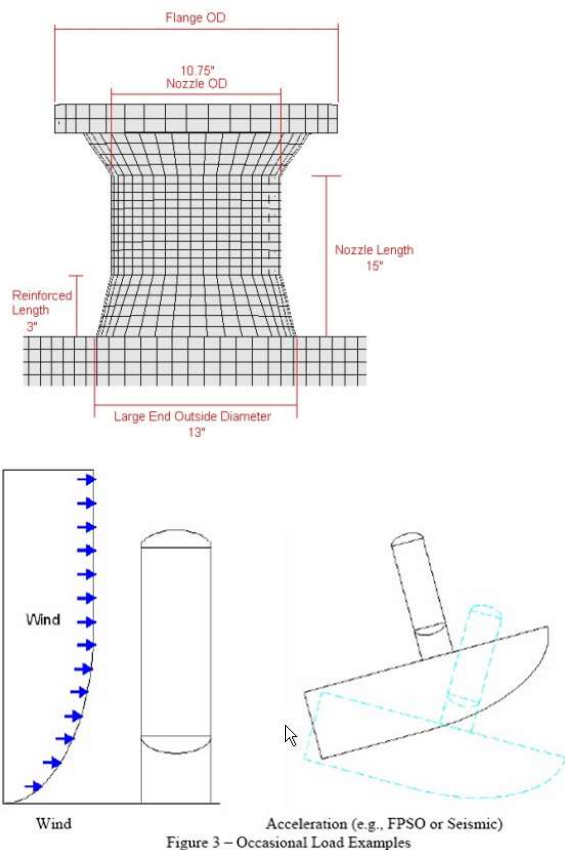
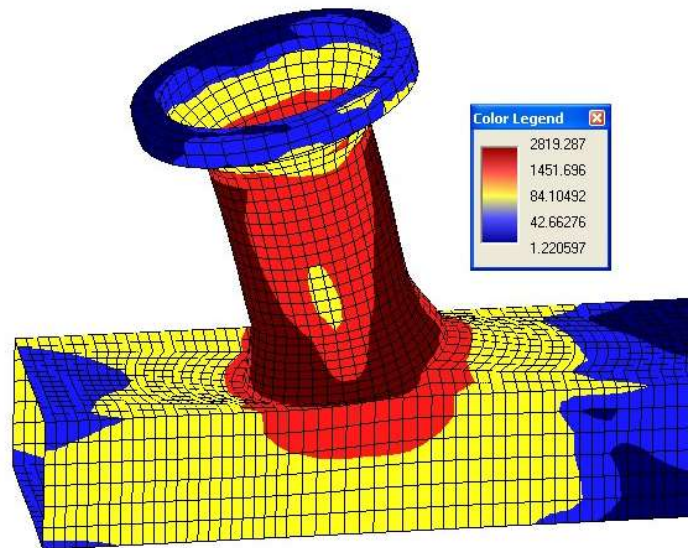


Figure 3 – Occasional Load Examples



**661PRO** is only available as a specialized module within FEPipe. It is not sold as an independent program.