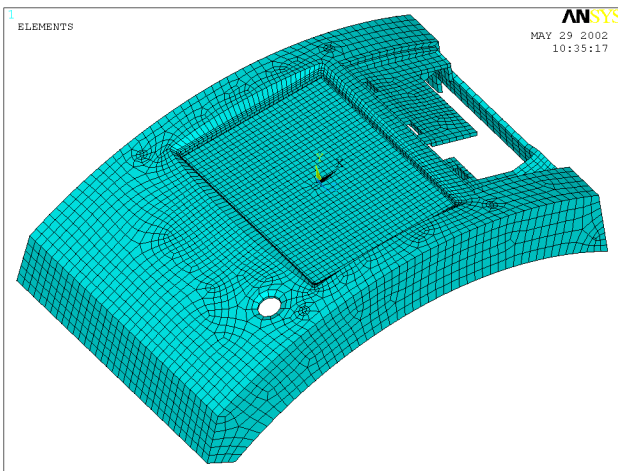


## **TOUCH SCREEN ASSESSMENT**

While FCL's core area of expertise lies in the design and assessment of pressurised equipment, many of the engineering methods employed may be readily transferred to other disciplines, enabling us to offer a valuable service to clients in many other industries. In one such instance FCL were contacted by a major manufacturer of medical instruments, who required an independent review of the fitness-for-purpose of a prototype LCD touch screen assembly forming an integral part of a new medical instrument. The principal objective of the work was to assess the suitability of the mechanical design for anticipated service conditions and to offer recommendations for improvements as necessary. Of key interest to our client was the performance of a foam rubber seal provided between the screen and the front bezel frame of the instrument, which was required to prevent the ingress of liquid under typical touch screen finger press and cleaning loads.



These aims were achieved firstly by carrying out a mechanical simulation of the unit using finite element stress analysis methods and, secondly, by undertaking a series of mechanical fatigue tests on sample units. The results of the analyses indicated a number of potential problems with the initial prototype, with a lack of compression achieved in some sections of the seal such that separation was predicted to occur under typical operator loads.

The work also indicated that, while stresses arising in the structure were not excessive, there were a number of localised features which were deemed likely to compromise the integrity of the adhesive film between the glass screen and its backing plate. Furthermore, the mechanical fatigue testing demonstrated that significant amounts of permanent set were likely to occur during the life of the unit which would exacerbate the lack of seal predicted by the analyses.



On the basis of these results FCL went on to identify a number of modifications, including the addition of extra mounting points, a change to the seal material, the addition of a narrow raised nib on the underside of the bezel to reduce the contact width with the seal and various structural design changes aimed at improving the rigidity of the touch screen assembly. The timely identification of these design flaws enabled our client to introduce appropriate modifications before investing further in large scale manufacture of the item.