# Steel Founders' Society of America

10.17.06

**University of Iowa/MTI Study of the variability of Niyama Values from available from commercial software.**

The Materials Technology Institute, which includes in its' membership oil, chemical, petrochemical and engineering companies has shown great interest in the work carried out at the University of Iowa – Yield program.  In particular they have focused on the Gage R&R study of radiographic film interpretation.  The MTI members will often require that castings be radiographed to ensure quality levels are delivered.  However, they have continued to look at the issue of casting quality and established a Task Group to examine how they can better specify casting quality.  The UI work on leakers has aroused great interest at MTI to the extent that they wish to see how simulation may be included in their own purchasing specifications and possibly incorporated in ASTM and ASME standards and codes.  There are already precedents for the requirement of solidification simulation by purchasers.

Clearly different software packages calculate Niyama values at different points during solidification and use different units.  There are other variables which must also be considered in the modeling of solidification that are foundry dependent.  In order for the use of solidification simulation to be used by purchasers, there is a need to determine the variability that may be expected in the results so that unreasonable requirements that do not benefit the purchaser are avoided.

The attached documents describe the rationale and requirements of the study.  The intent is to determine the variability in the Niyama values, it is not to see how good a foundry is at risering a casting.  The "stl" files are available on the SFSA web site.  Although four alloys are shown it is not necessary for each foundry to simulate all four of the alloys.

If you have any questions regarding the study please contact UI.

Malcolm Blair