

From: "Steven Thomas" <sethomas@stpegs.com>
To: <Jrr@nrc.gov>
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Subject: Material Discussion

Jai,

The following paragraph will be added to our submittal today. We will also be submitting the material certifications for the two materials. Dr. Lee Swanger, our consultant from Failure Analysis Associates, has reviewed this information and will be available on the call later today to address any questions.

"The connecting rods for the Cooper KSV engines were produced to the Cooper Energy Service Material Specification No. C-5B. The mechanical properties are those specified by ASTM-A521 for Class CG forgings. The material specification allowed for alloys other than AISI-41XX with specific chemistry limits on carbon and other elements. The #4 connecting rod which failed in 1989 was AISI 1050 steel, oil quenched and tempered to 197-241 Brinell, straightened and stress relieved at 1000F. The #9 connecting rod was AISI 4140 steel similarly processed to meet the same Cooper specifications. Small changes in chemistry for similar steels do not affect fracture toughness significantly, provided the method of forming, heat treatment, and stress relief produce the same microstructure, yield strength and hardness, as is the case for these connecting rods. Therefore, fracture toughness properties for all connecting rods are expected to be nearly identical, since all the rods were produced to the same Cooper specifications for hardness and yield strength. Connecting rods used for the repair of SDG22 are "new" old stock manufactured to the same material specifications."

-check 50-499
-PM is T. Alkhan

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