CORRO-CONSULTA

8081 Diane Drive | Rudolf H. Hausler | Kaufman, TX 75142
Tel: 972 962 8287 (office) | *rudyhau@msn.com* | *Fax: 972 932 3947*
Tel: 972 824 5871 (mobile)

Richard Webster, Esq. July 29, 2007
Rutgers Environmental Law Clinic
Rutgers University
Newark, NY

Mr. Webster:

I have read "AmerGen's motion in limine to exclude portions of Citizen's initial written submission".

Just as medical doctors, for instance, have to be well versed in general medicine, before specializing in surgery or any other medical specialty, so have corrosion engineers to be well versed in the various basic scientific and technical aspects underlying their science. Corrosion Engineering is probably one of the most complex technical endeavors one can think of. It involves well over 30 odd distinctly separate sciences [1)] from electrochemistry to metallurgy and chemistry as well as physics, including semiconductor phenomena. It is precisely the broadly conceived curriculum at the Swiss Federal Institute of Technology, one of the foremost European institutions of higher learning that prepares for, among many other possibilities, the entry to such a demanding field as Corrosion Science and Technology. Since gaining that education, I have acquired additional expertise through long experience.

For example, in the work carried out for EPRI aimed on the development of a corrosion inhibitor for the aggressive solvents in use for chemical cleaning of nuclear steam generators, I have demonstrated detailed knowledge of organic chemistry, electrochemistry, electrolyte (complexing) chemistry, as well as metallurgy and chemical process chemistry (removal of denting) [2)]. The inhibitor became commercial and was used around the world in many cleanings for at least 20 years. (It should be mentioned, perhaps that the work was carried out under EPRI guidance in close cooperation with Babcock and Wilcox, Westinghouse and Combustion Engineering, as well as numerous other companies).

With regard to expertise on coatings, one of the activities a corrosion engineer is often called upon is failure analysis. I routinely carried out such failure analyses at Petrolite as

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[1)] see Donald Tuomi: *Corrosion, the most general problem in material science,* published in Corrosion Chemistry, George R. Brubaker. Beverly P. Phipps, editors, ACS Symposium Series, Vol 89, pg. 1, 1979. The Symposium had been organized and conceived by Dr, R. H. Hausler, see foreword.

[2)] This work was done after the nuclear power plant operators under the oversight of NRC had badly misjudged the effects of galvanic coupling between Inconel and carbon steel on the corrosiveness of the cleaning solution in use at the time.

a service to customers and at Mobil for the purpose of understanding failure mechanisms of oil field tubulars. Such tubulars are frequently internally coated and failures of these coating systems were rather frequent. One of the most frequently used coatings is based on epoxy chemicals (Tuboscope's TK-7 for instance). One of the failure mechanisms, established in detailed examination by means of Scanning Electron Microscope studies of the underlying steel surface is the formation of a minute oxide layer prior to coating. This, in addition to slow diffusion of water and corrosive gases across the epoxy boundary is often the cause for de-lamination, blister formation, and subsequent breaking of the bubble and rapid attack of the metal. The various and detailed studies regarding coating failure I performed in line of service to either Gordon Lab, Petrolite, or Mobil are too numerous to list.

With regard to statistical experience, please find attached a summary of selected papers that I have published that used statistical analysis to assess corrosion. The summary also includes my selected experience with statistics gained through education, teaching, and practical experience. Once again, I trust the panel will find my experience to be more than sufficient for the present purpose.

Best regards

Rudolf H. Hausler