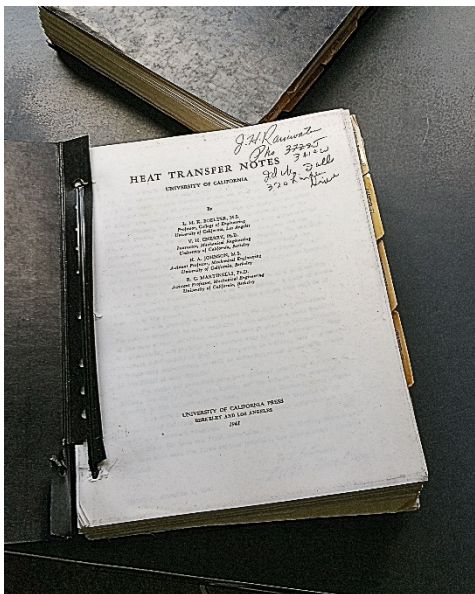


I came to camp NRTS in December 1957 as the ETR was trying to get to power. As I remember it was held at 80 rather than 175Mw. I was in Joe Rainwater's Plant Engineering with exceptional people. My boss was Ed brown, super nice guy.

I measured gas in the ETR primary water, scanned fuel assemblies with a neutron beam atop MTR, worked up a "hot-spot-hot-channel core analysis", and did lots of flow calculations. I once complained to ED that I had done nothing in the past six months but plug numbers into the Fanning Equation.

I had the most satisfaction working on the conceptual design of ATR and EOCR. The conceptual design teams liked to work in a single room so that communication and coordination was instant, such as a warehouse at Central, and I learned a lot listening Frank Haas and Ollie Hauge work out the facility design concept together.

I spent a long time doing hot-spot-hot-channel analysis of ETR cores. Joe Rainwater, who had coached me in setting up the first one, wrote a letter to the magazine Nucleonics, suggesting that a probability approach be used in the analysis. He then worked with me to develop a calculation, which later was put to use. I learned decades after this that Naval Reactors had such a procedure that was classified.



This picture indicates the level of analysis of the time. Joe Rainwater had a copy of the class notes of .UCLA Professor LMK Boelter (of Dittus Boelter equation fame). They were widely known just as Heat Transfer Notes. Joe had a copy made for the members of Plant Engineering who dealt with Heat Transfer. Alba Goodwin tediously copied the notes one sheet at a time on a wet process copier by 3M. It was the best reference for our work.

This is a current picture, but the books sit on a Steelcase battleship grey desk identical to the one I and all of us had.

Calculations were done on slide rules.

There were Marchant calculators that were sometimes used. J Ernest Wilkins, the math prodigy who served as Vice President of whatever we were called at the time, once gave a talk to a large

audience in which he described pulling the handle and the Marchants going ka chunk, ka chunk as one calculated some number. At the end of the passage, the audience applauded loudly. Engineer nostalgia runs deep.

Almost none of the work we did or developed was published outside. We were a plant group doing our job.

There was a reference work for MTR, which we called the green book, I think. The Safety Analysis Report for MTR, then called "Hazards Report" was still classified and kept in a safe at MTR. I looked at it a few times. MTR building was thick concrete, to resist bombs, and an irrigation ditch that passed through the site was obliterated so that it could not be used as a line along which a bomber could fly to attack the reactor.

The designers of MTR thought of everything and prepared for it. Much of our startup work on ETR was verifying that MTR design features like full-flow degasification, which had been eliminated in ETR, was not needed.