

MSRE 50th Anniversary

Recognition of MSRE and MSR Pioneers

Murray Rosenthal

Dick Engel

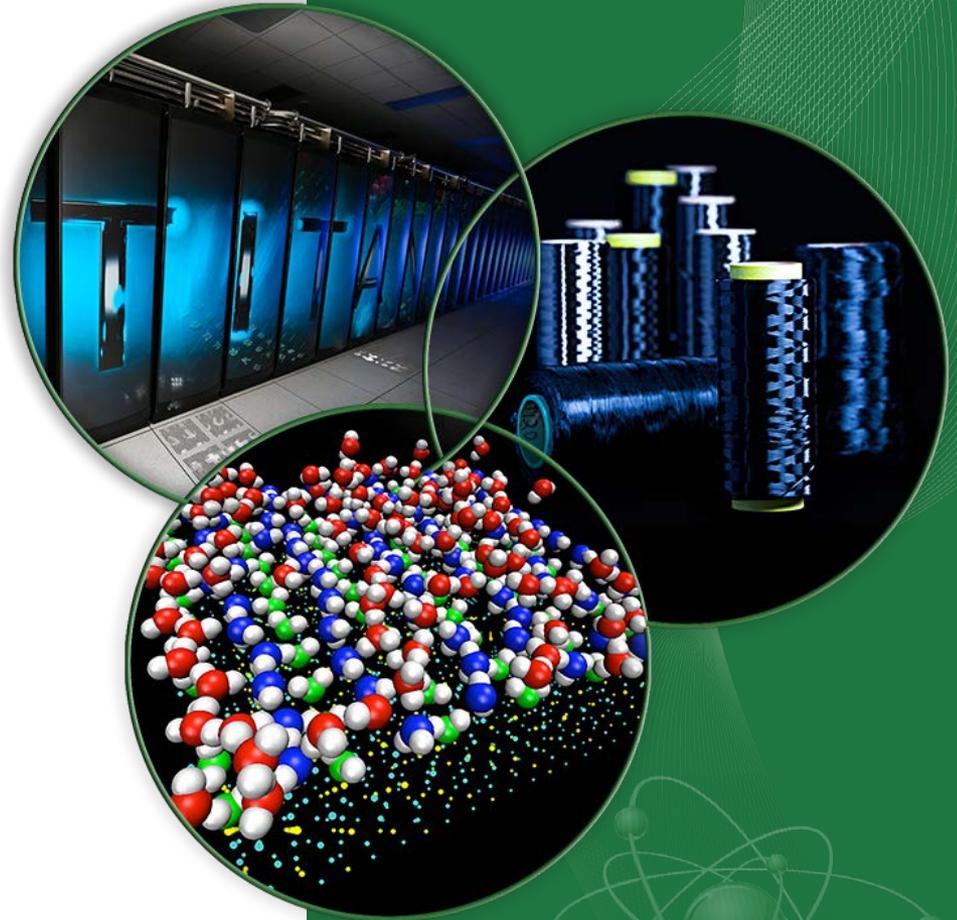
James Crowley

Bill Nestor

Mac Toth

Syd Ball

Introductions by Jim Rushton



MSR Pioneers and Key Roles

- Murray Rosenthal - MSR Program Director
- Dick Engel - MSRE Chief Engineer
- James Crowley - Deputy Operations Supervisor
- Bill Nestor – MSR Nuclear Engineer
- Mac Toth – Molten Salt Chemistry
- Syd Ball - Reactor Dynamics













MSRE Dynamics

- **How well can MSRE dynamics be predicted over its full power range?**
 - **Inherent safety, stability, controllability**
 - **Low-power oscillations were predicted**
 - **Opportunity: Case made for a detailed study – theory & experiment**
- **RESULTS:**
 - **Dynamics are well-understood – full range of powers**
 - **Inherent safety features confirmed**

As power increases, oscillations are more damped, & at higher frequencies

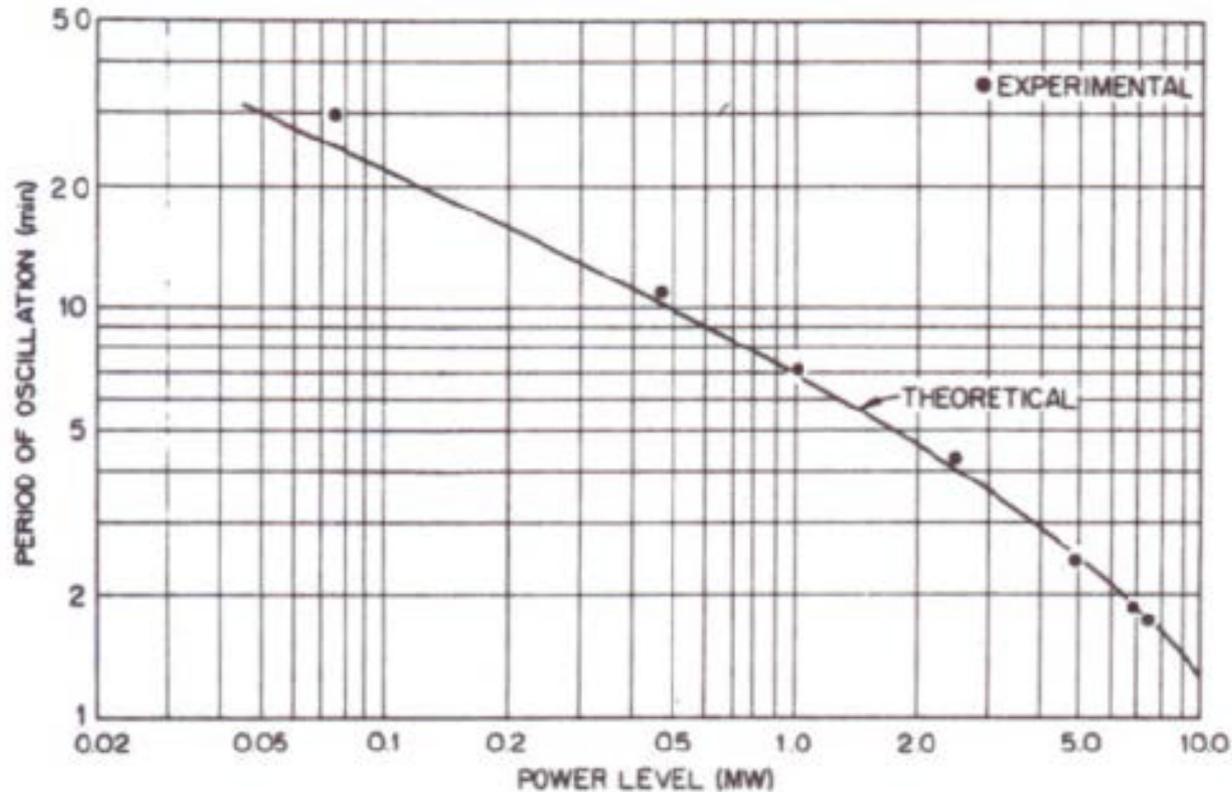
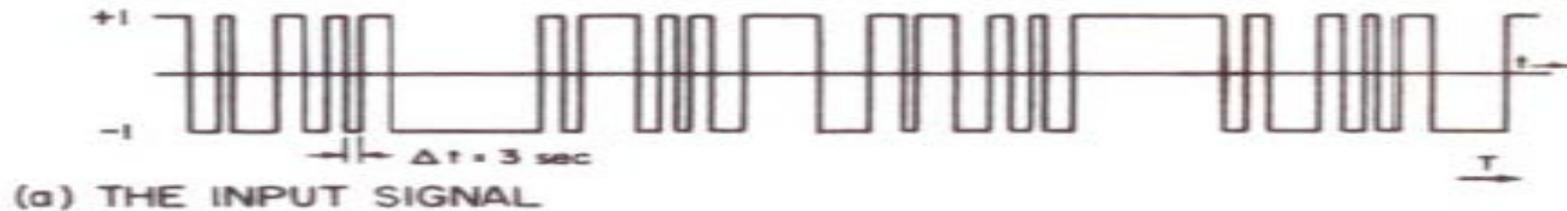


Fig. 12. MSRE natural periods of oscillation.

Theory: Ball & Kerlin – ORNL-TM-1070 (Dec. 1965)

Experiment: Kerlin, Ball et al – Nuclear Technology 10 (Feb. 1971)

MSRE dynamics tests – PRBS rod control

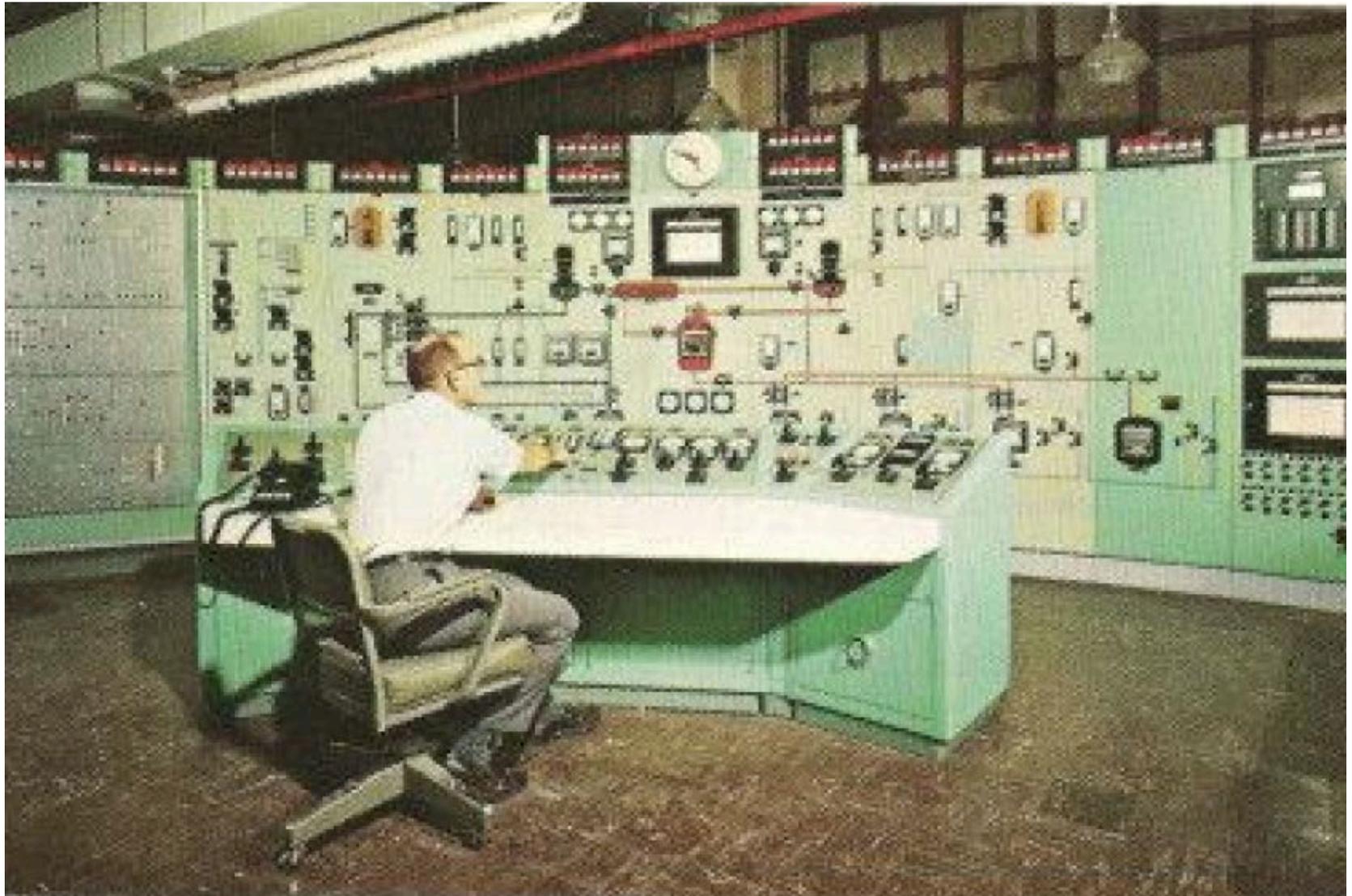


PRBS test excitement...

- Dark & stormy night...
- PRBS test running smoothly
- Rod “jogger” sticks in “withdrawn” position
- Power level rises, exceeds “maximum”*
- Power decreases (to normal) on its own
- Experimenters (Tom Kerlin & Syd) record event, go home

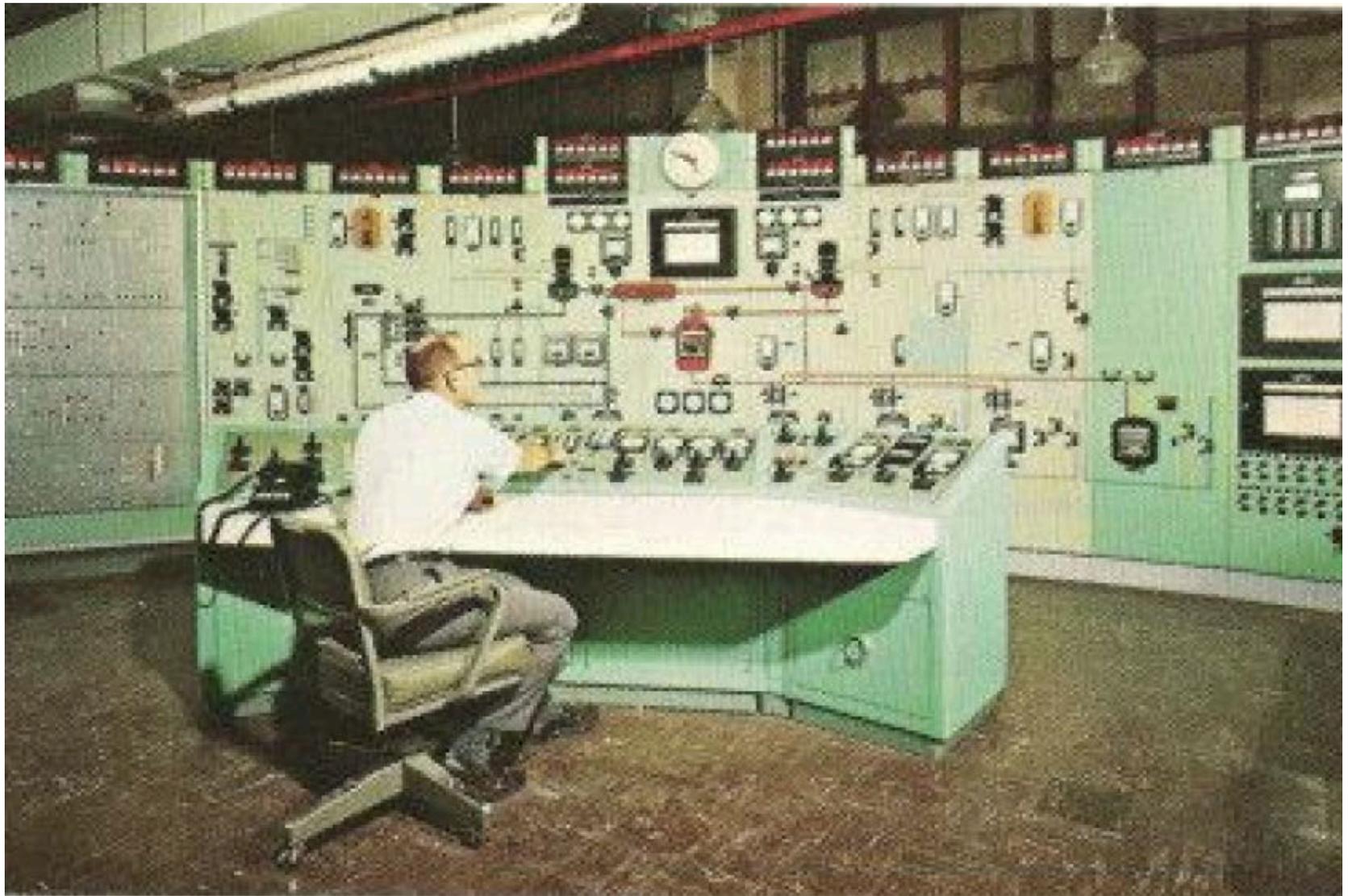
(* *highest ever!...*)

MSRE control room – during operation*



*reactor powered by neutrons

Earlier: MSRE control room – training simulator*



*powered by 2 EAI TR-10 portable analog computers







**“There is no heavier burden
than a great potential!”**

with our apologies to Charles Schulz