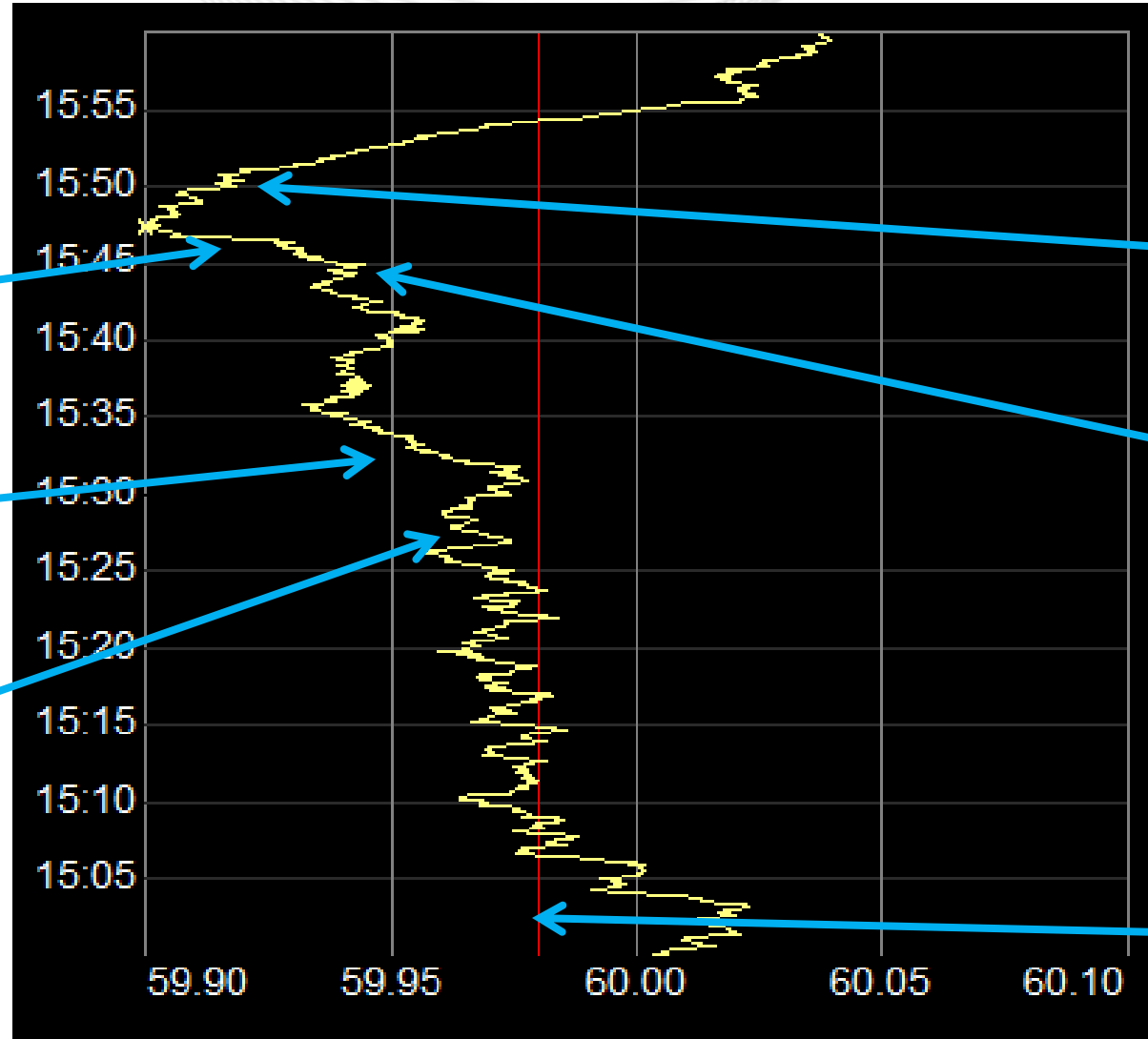




# 7/10/18 Low Frequency Event

System Operation Subcommittee

- On 7/10/2018, a low frequency of 59.903 Hz occurred at 15:46hrs
  - Time Error Correction was in effect starting at 12:00hrs
    - Scheduled frequency set to 59.98Hz
  - Generation lost:
    - 400MW unit ran back at 15:27
    - 800MW pseudo tied unit tripped at 15:46, 400MWs was scheduled into PJM
  - PJM Tie Error 900MW-1,800MW low
  - Corrective actions taken:
    - Called 2,600MWs of additional combustion turbines (CTs) between 15:27 and 15:52
    - Deployed 100% RTO Synchronized Reserves at 15:45
    - Requested Simultaneous Activation of Reserve (SAR) with NPCC at 15:50hrs



.03Hz drop.  
Pseudo tied unit  
trips (800MWs)

.04Hz drop. Cause  
unknown. The NERC RS  
investigating.

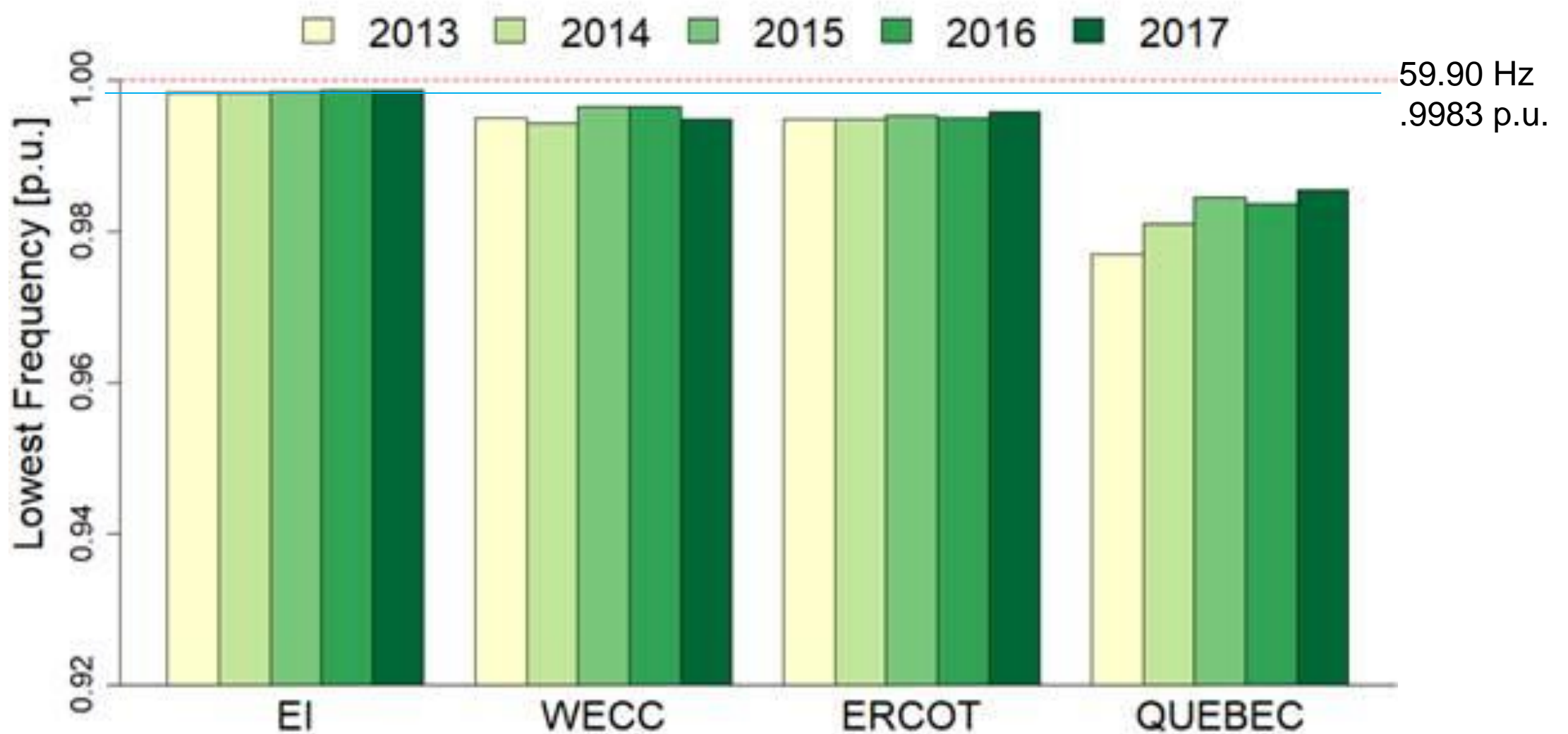
Generator runs  
back (400MWs)

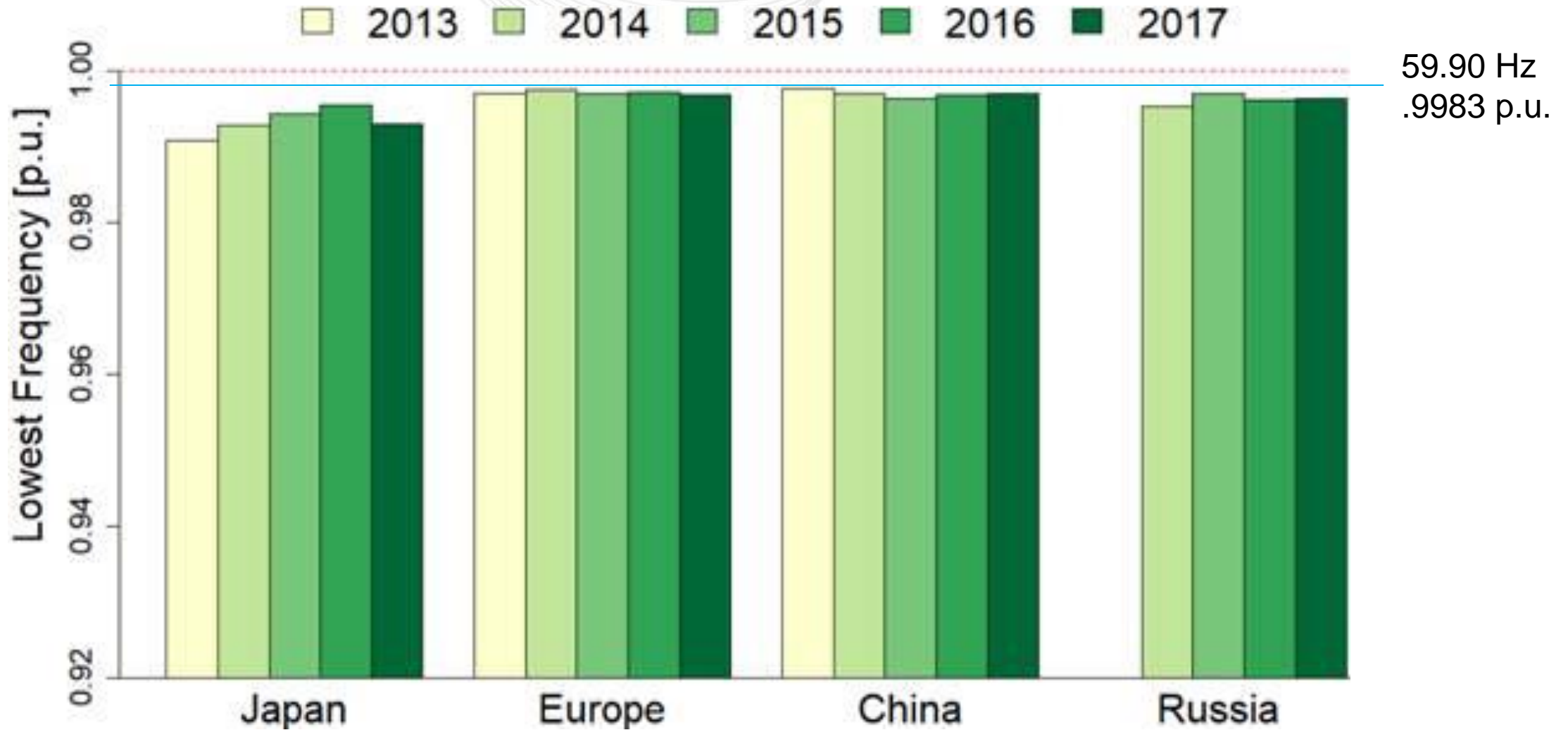
Simultaneous Activation  
of Reserve (SAR)  
initiated.

Synchronized Reserve  
Event initiated

Scheduled  
frequency (59.98  
Hz)

- PJM tie error was ~900MWs low leading into the Synchronized Reserve event and dropped further down to 1,800MWs at the frequency's lowest point. Causes:
  - Steam generation deviating from basepoints (600MWs)
  - Loss of pseudo tied unit
- While not normal, frequency deviations down to 59.90Hz happened every 2-3 years in the EI.





- PJM is performing an internal Apparent Cause Analysis (ACA)
  - The ACA will include a review of the SCED cases
- PJM is coordinating with the NERC Resource Subcommittee regarding the initial frequency drop
- Review results of the analysis with the SOS and OC