Achieving a Successful Alarm Management Deployment

(The CLS Experience)

Elder Matias
Elder..matias@mightyoaks.com
http://www.mightyoaks.com/

The Challenge….

- Multiple stakeholders
- Meeting Regulatory requirement (NREG-700)
- Dynamic notification for beamlines
- Handling both manned and unmanned operation.

MIGHTYOAKS

Canadian Centre canadien
Light de rayonnement
Source synchrotron

Starting Point ….

MIGHTYOAKS

Canadian Centre canadien
Light de rayonnement
Source synchrotron

Starting Point ….

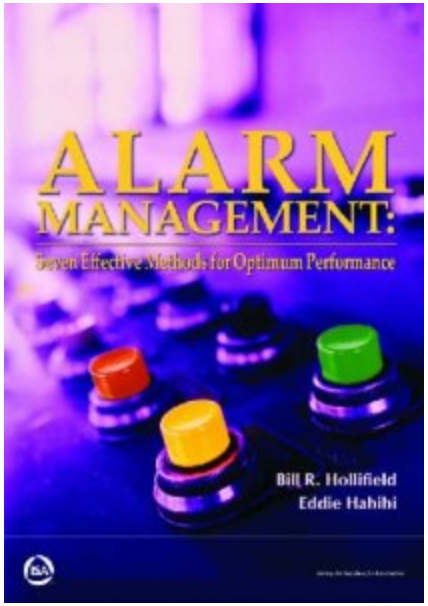
- Past attempts at alarm management lacked a high level and systematic strategy
  - Results were inconsistent and not effective
- Solution was to go back to basic principles and adopt a systematic approach
- Similar to SNS we initially adopted the process in Bill Hollifield's book
- Later adopted aspects of ISA 18.2

MIGHTYOAKS

Canadian Centre canadien Light de rayonnement Source synchrotron

Starting Point ….

- Past attempts at alarm management lacked a high level and systematic strategy
  - Results were inconsistent and not effective
- Solution was to go back to basic principles and adopt a systematic approach
- Similar to SNS we initially adopted the process in Bill Hollifield's book
- Later adopted aspects of ISA 18.2



Some basic principles ….

- Major alarms – indicate a trip or inability to inject into the machine
- Minor alarms – indicate degraded performance that will eventually result in a trip
- Every alarm must have context and must require an operator to do something
- Temporary user initiated state changes to inhibit injection should auto-acknowledge
- Alarms requiring immediate attention should have audio voice synthesis and trigger auto-dialler if expected during shutdown periods

MIGHTYOAKS

Canadian Light Source Centre canadien de rayonnement synchrotron

Software Platform (#1)

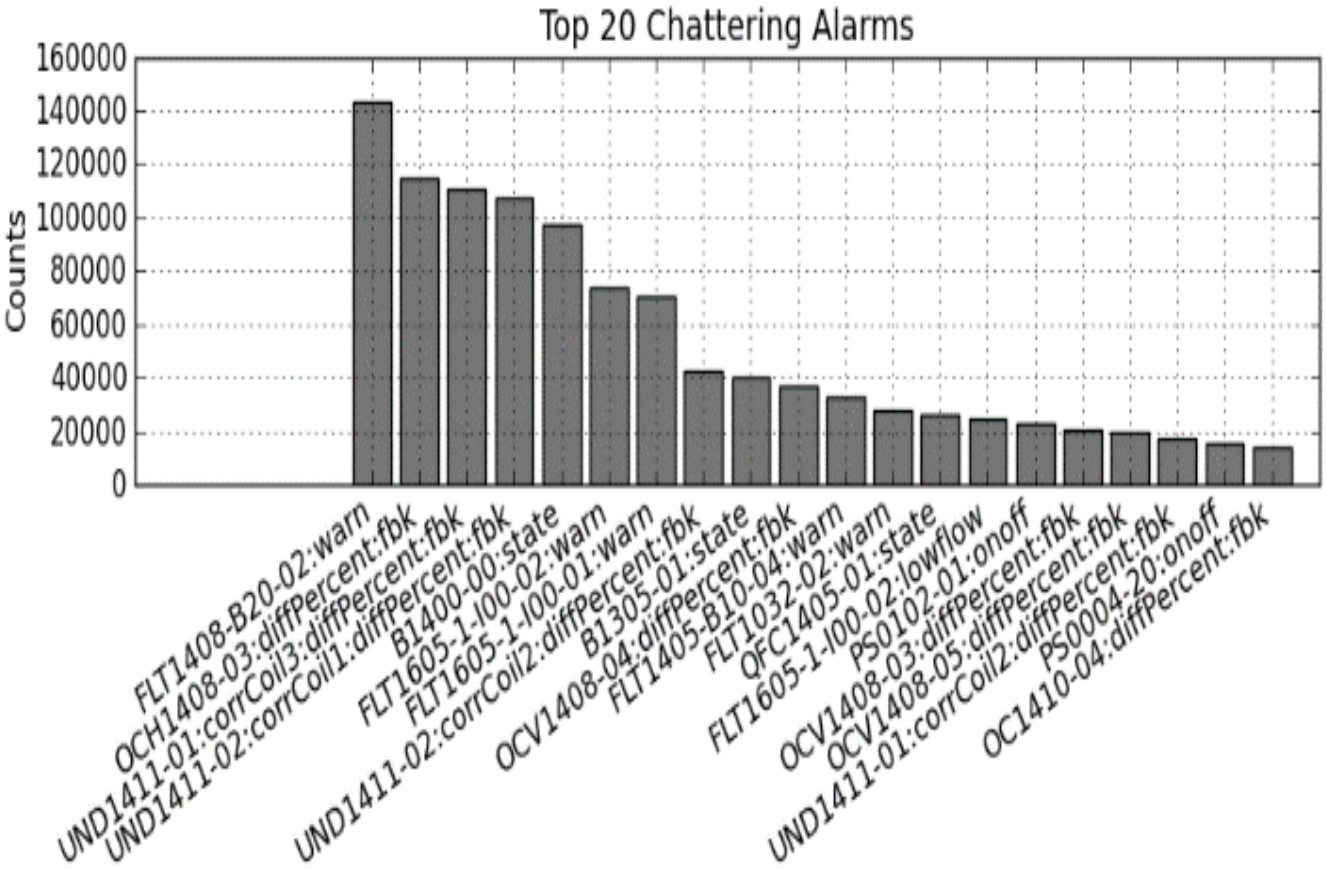
- CSS – BEAST
  - Thanks Kye (SNS), ….
- Systematic review was performed (jointly by Controls and Accelerator Physics) to determine alarms and response procedures
- Multiple deployments:
  - Control Room (Accelerator Operations)
  - Control Room (Mechanical Services)
  - Safety (HSE group office area) – in progress
  - Controls (IOC health monitoring) – in progress

MIGHTYOAKS

Canadian Light Source Centre canadien de rayonnement synchrotron

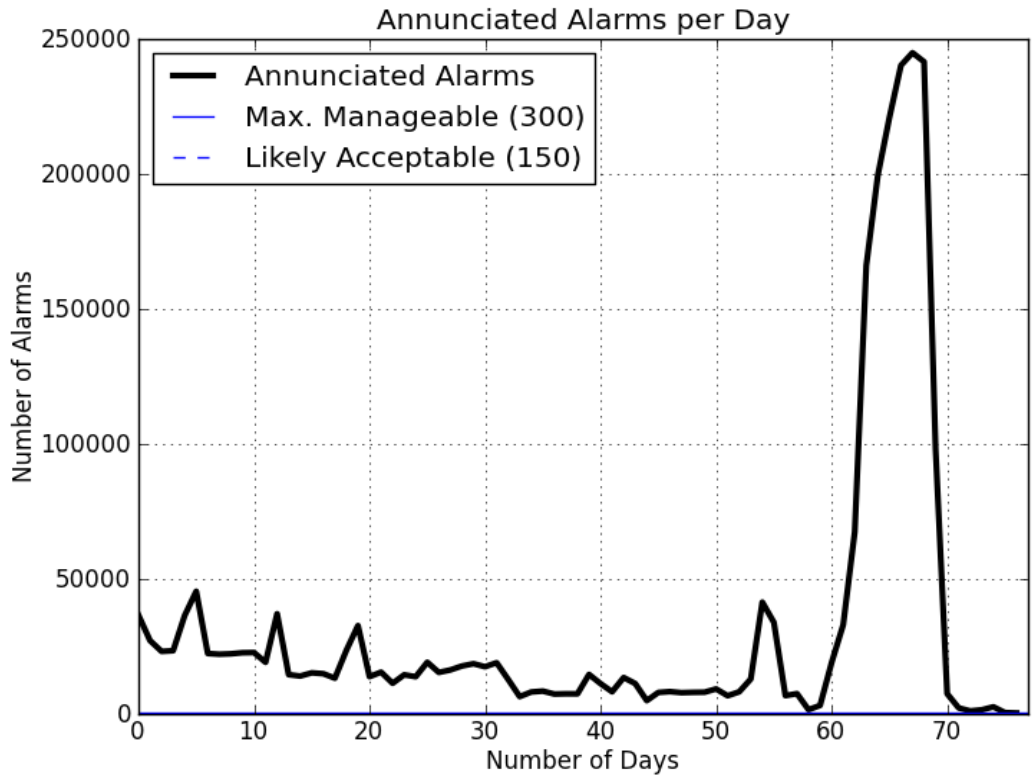
CSS Optimization

- Alarm handler should be optimized by periodically reviewing chattering alarms



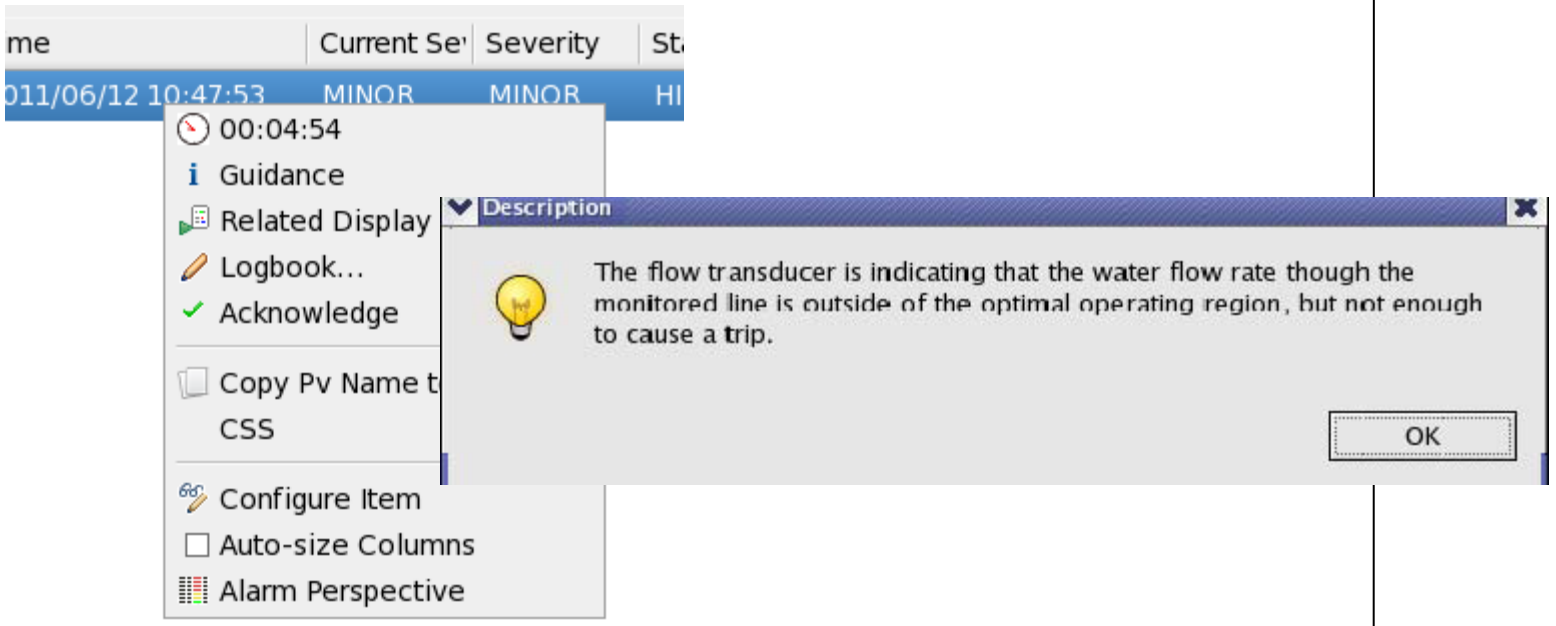
CSS Optimization

- Periodically reviewing the number of alarms generated is helpfully in understanding and optimizing loading of CSS



Multiple Deployments?

- Not quite ISA compliant
- However it makes sense in our case.
- Different groups want to perform activities based on different alarms.



Platform (#2)

- Master Alarm Panel
- EPICS Panel
- Linked to Repeating Voice Annunciation

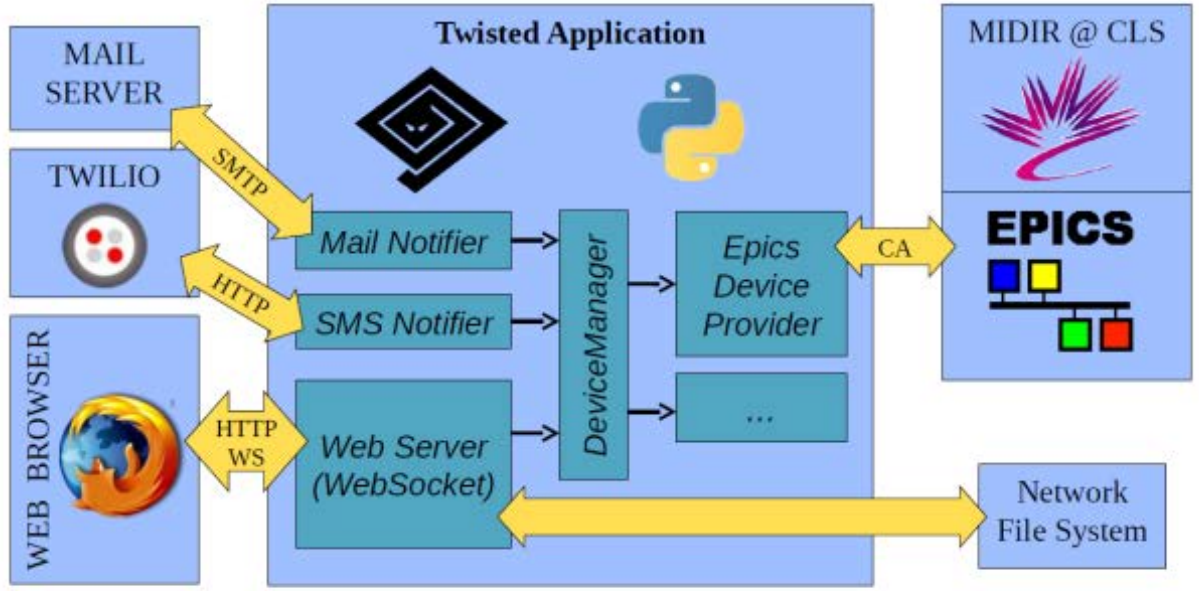
MIGHTYOAKS

Canadian Centre canadien
Light de rayonnement
Source synchrotron

Platform (#3)

- Control System web (for beamlines) – written by Dylan Maxwell

Control System Web Architecture



Conclusions

MIGHTYOAKS

Canadian Centre canadien
Light de rayonnement
Source synchrotron

Conclusions

- The strategy and alarm management philosophy is the critical success factor
- CSS is a sound platform
- Some augmentation is needed by other tools, longer term integration would be helpful.

Acknowledgment ….

Former Project Staff:

- Laurier Baribeau (now at McGill University)
- Chris Payne (now at cFactor)
- Mark Li (now at CLS - Electrical Engineering)

Current Project Team:

- Tonia Battan (CLS – Controls & Instrumentation)
- Ward Wurtz (CLS – Accelerator Operations)

SNS and DESY (for developing CSS framework)

MIGHTYOAKS

Canadian Centre canadien Light de rayonnement Source synchrotron

Thank you….

www.lightsource.ca

www.mightyoaks.com