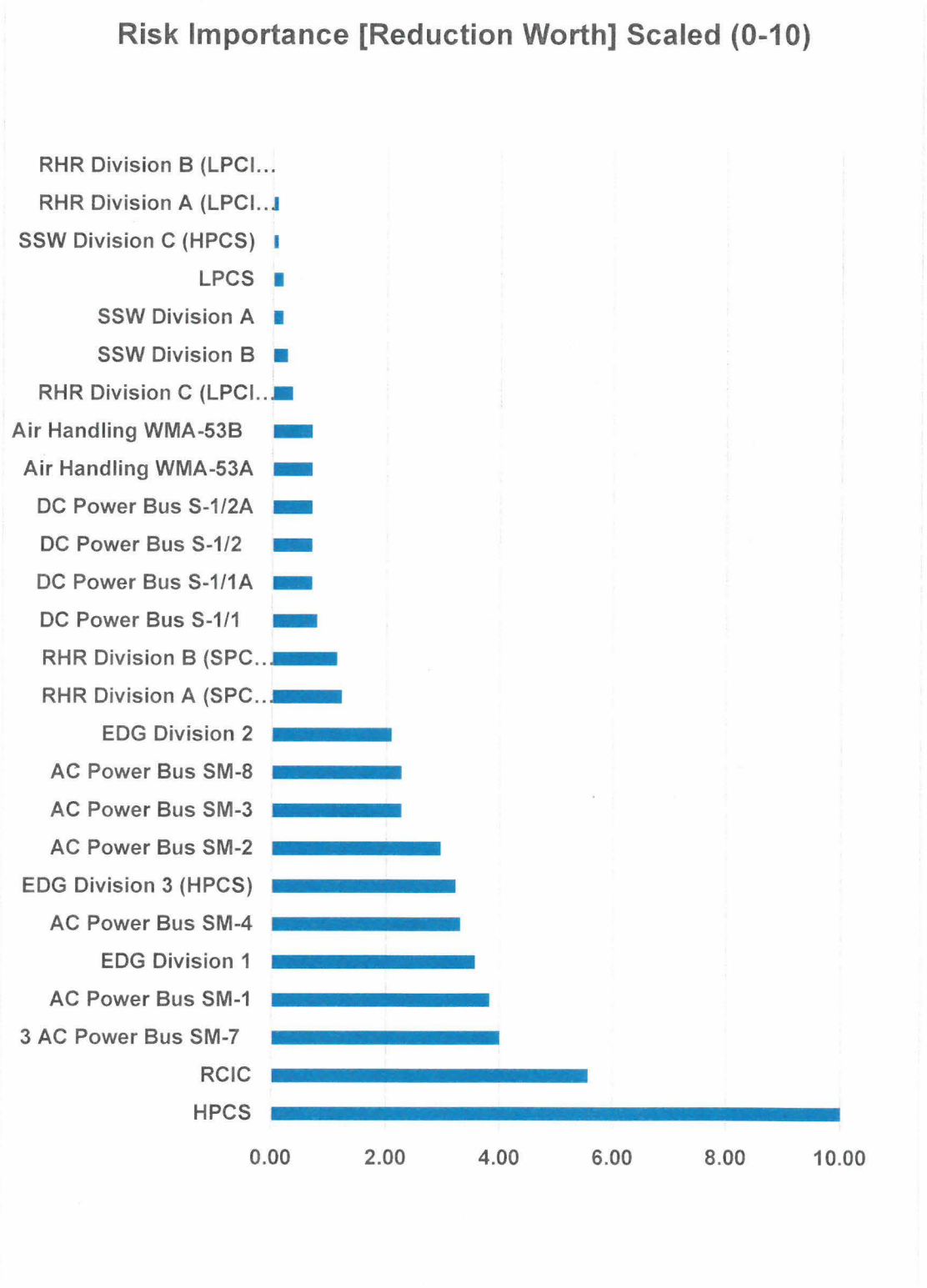
NRCExecSec Resource

From: Timothy Margulies <t.margulies@gmail.com>
Sent: Thursday, February 27, 2020 11:07 AM
To: NRCExecSec Resource
Subject: [External_Sender] "Flight Recorders"
Attachments: ColumbiaNPPRRW.pdf

A brief memo is in the attached file. Do any plants have a recording of critical parameter display panel signals? The memo addresses the seismic/volcanic vulnerable northwest power plant.

Columbia Nuclear Generation Station



Reference: Columbia Generating Station License Renewal Application Environmental Report, Attachment E Page E-139 January 2010

Risk importance can be defined as a ratio or an interval. The risk reduction worth represents the decreased risk level with the feature optimized or assumed to be perfectly reliable. The risk achievement worth represents the increased risk level without feature or system assumed failed. Other risk measures in TEMAC (Top Event Matrix Analysis Capability) include a local differential sensitivity and a statistical uncertainty measure.

Proposed Independent Plant Examination Modifications

Modification	$ 10^6 [M]
additional DC battery capacity	1.7992
additional diesel generator	10.816
develop procedures to repair/replace failed 4KV breakers	0.375
hardware changes to establish 500 KV backfeed thru main step-up transformer	1.7
reduce CCF's between EDG-3 and EDG-1/2	0.1
replace EDG-3 with diesel diverse from EDG-1 and EDG-2	4.2
add additional boron injection system	0.8
add system relief valves to prevent equipment damage from equipment spikes during an ATWS	1.125
automate SLC in response to ATWS event	0.66
diversify the explosive valve operation	0.37
install additional pressure or leak monitoring instruments for detection of ISLOCAs	5.6
increase leak testing of valves in ISLOCA paths	0.4
revise EOPs to improve ISLOCA identification	0.02
improve operator training on ISLOCA coping	0.03
install independent active or passive HPIS	29.12
additional high pressure injection pump with independent diesel	5.2
raise RCIC backpressure set points	0.082
improve ECCS suction strainers	10
independent method suppression pool cooling	6
add redundant DC control power for pumps	0.65
replace ECCS pump motors with air-cooled motors	1.125
provide self-cooled ECCS seals	0.675
add a service water pump	6.136
install additional transfer and isolation switches	2
improve fire resistance of critical cables	0.4
improve fire resistance of critical cables	0.1
provide a redundant train or means of ventilation	0.48
modify safety related CST	0.98

Sum (2008 $M)	90.94293

[Reference: Columbia Generating Station License Renewal Application Environmental Report, Appendix E]

2020 U.S. dollars would increase by approximately 19.25 % [$108.45 M].

$100 in 2008 has the same "purchasing power" or "buying power" as $119.82 in 2020 as calculated below.

$$\frac{CPI\ (2020)}{CPI\ (2008)} \times 2008\ USD\ value = 2020\ USD\ value$$

$$\frac{257.971(2020)}{215.303\ (2008)} \times \$100\ (2008\ USD\ value) = \$119.82\ (2020\ USD\ value)$$

[2008 dollars in 2020 | Inflation Calculator." Official Inflation Data, Alioth Finance, 27 Feb. 2020, https://www.officialdata.org/us/inflation/2008.]

Operating United States commercial power plants meet quantitative safety goal guidance and acquire nuclear liability insurance by the Price-Anderson Act which is required to help cover severe accident damages. The benefits of nuclear power generation at many plants are continued for longer than initial license for operation. Probabilistic safety-risk analyses and environmental reports have accompanied license extension applications. Ongoing programs of inspection and events analysis by the USNRC and by industry sponsored INPO [Institute of Nuclear Power Operations, Atlanta, Georgia] constitute their evaluative process for operational assessment and operational evaluation of the nuclear systems.

Prevention of accident is the preferred policy option for engineering systems. Predictive reliability analysis during the design phase of the technology helps assure system availability through redundancy and diversity of active and standby systems. Mitigation options for beyond design basis accidents have been proposed and assessed as not justified by risk cost-benefit analysis. Stricter policy objectives of isolating pathways of radioactivity from potentially harming humans or the environment would have to be mandated by regulation; however, for additional costs for modification. A "flight recorder" or critical parameter display panel signal recordings, as well as, selective systems condition monitoring beyond inspection should perhaps receive attention.