Bighorn: Real-time Continuous Structural Monitoring

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AGU

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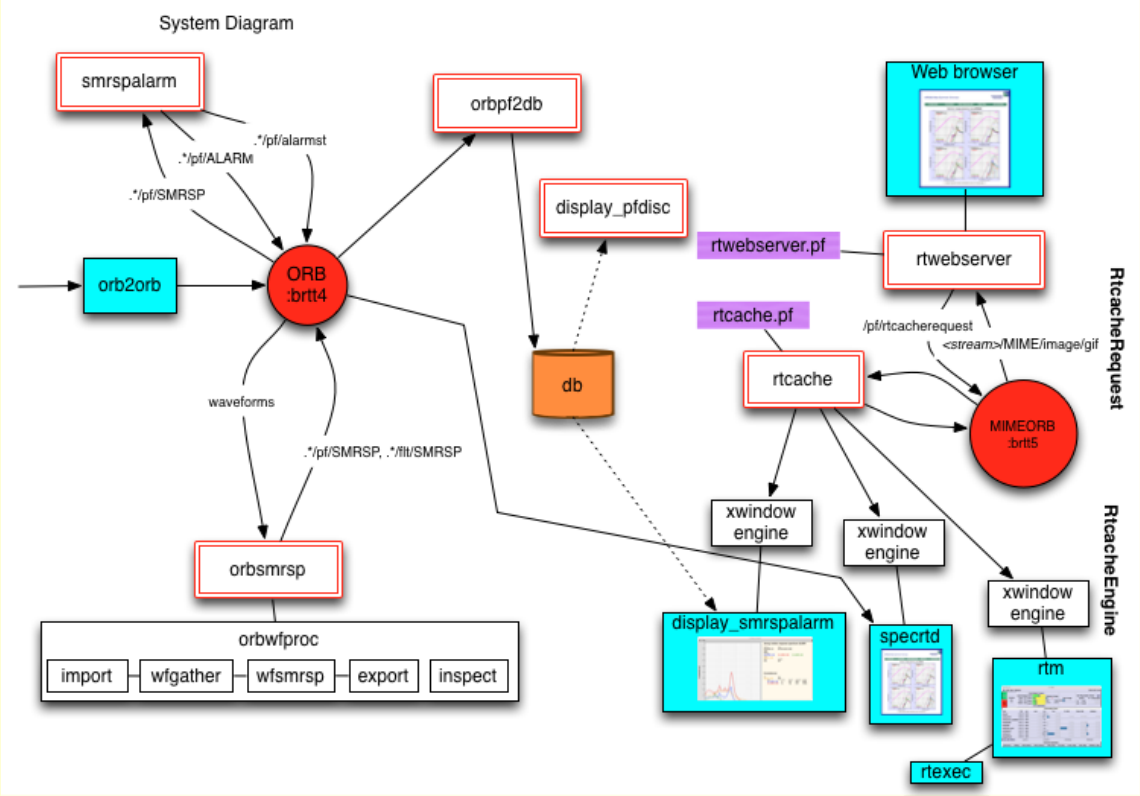
Bighorn

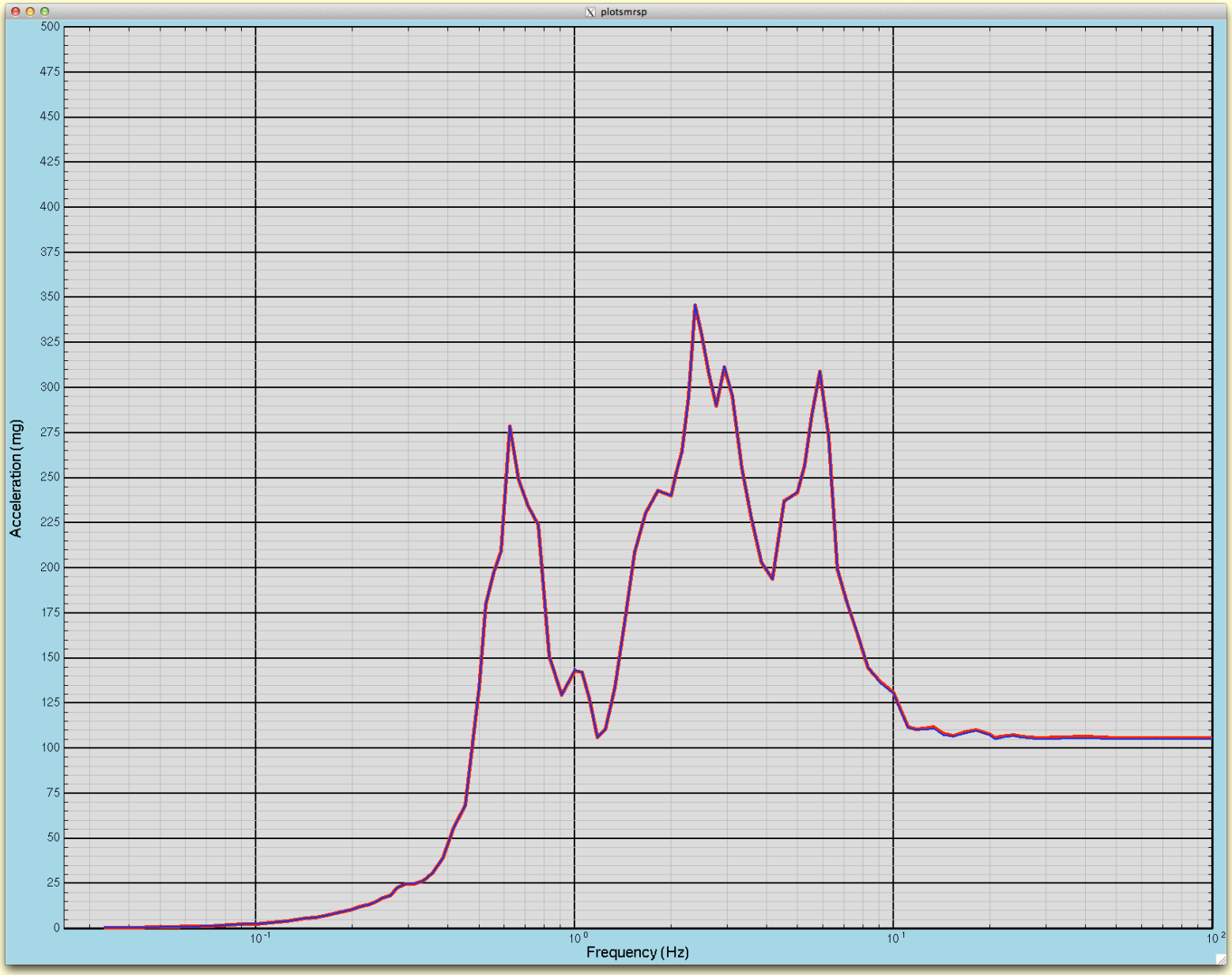
- Peregrine plus engineering analysis tools
- Antelope + rtwebserver + real-time spectral monitoring and alarm capabilities
- Monitor, study, and react to the spectral content of your data

Example Bighorn RT System



Bighorn - `orbsmrsp`

- New ability developed for producing continuous time-dependent strong motion response spectra
- Expanded floating point data representations within ORB packets and Datascope waveform files
- Pf ORB packets to represent time continuous strong motion response spectra
- Provides a very fast method for computing continuous time-dependent response spectra for large numbers of channels



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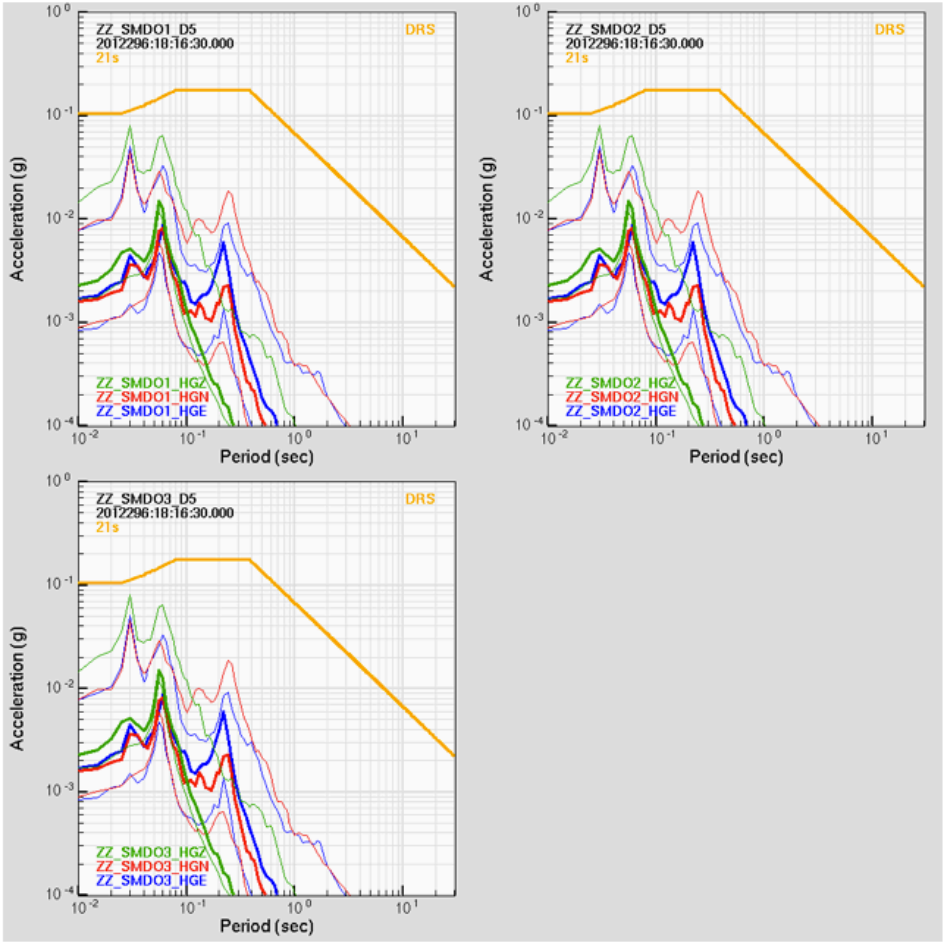
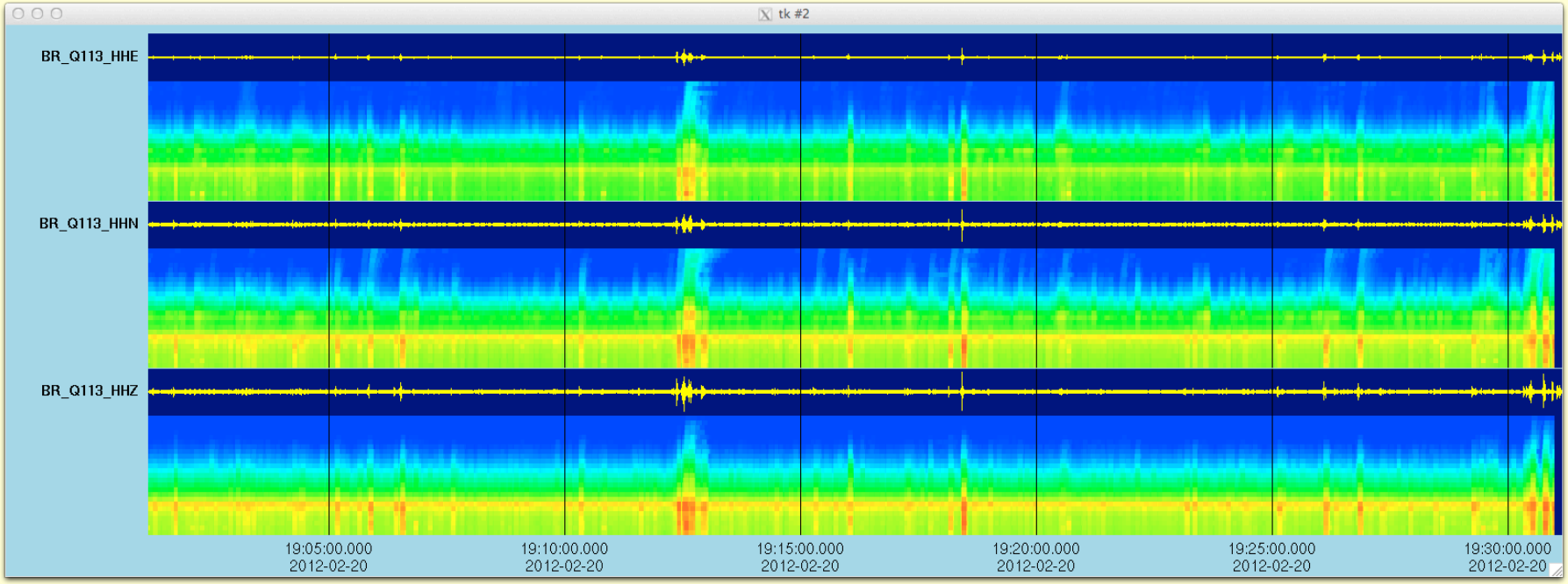
BIGHORN WEB DISPLAY SYSTEM

OVERALL | FACILITY MAP | SPECTRA | FACILITY SOH

SMDEMOO FACILITY STATUS: NORMAL

OUTPUT FROM SPECRTD FOR FACILITY: SMDEMOO FACILITY





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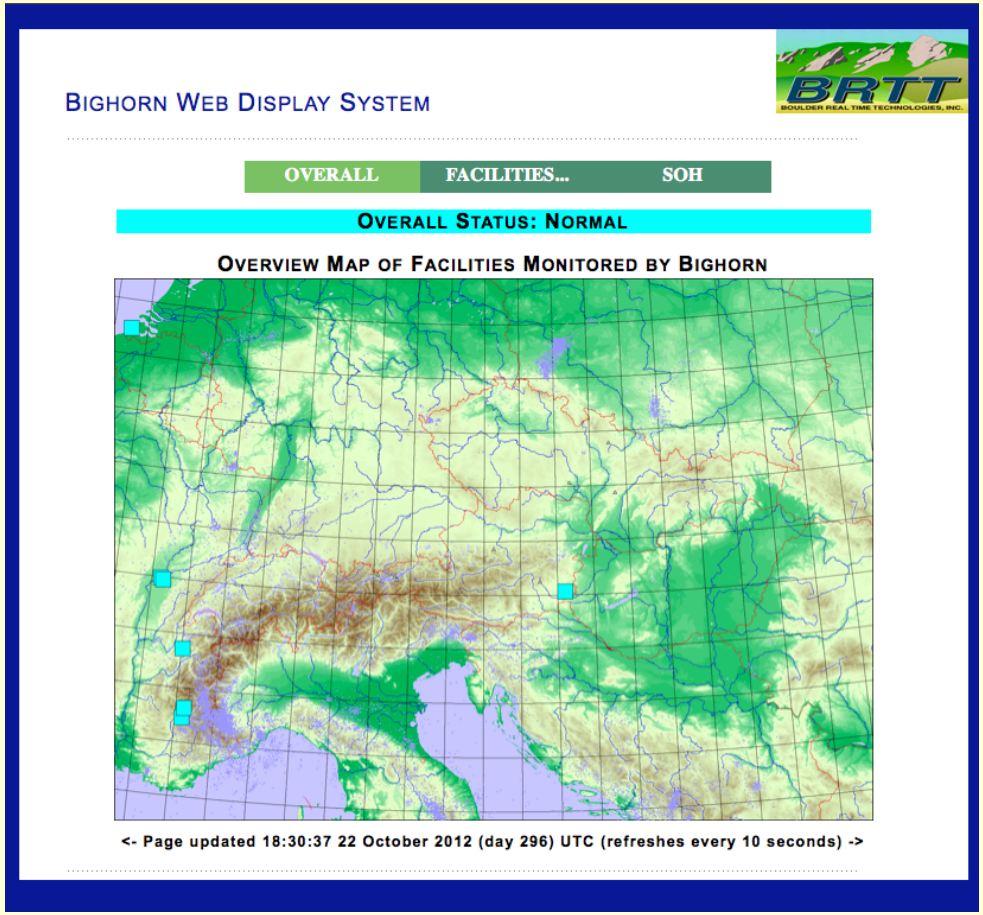
Bighorn Example: Network Overview Center



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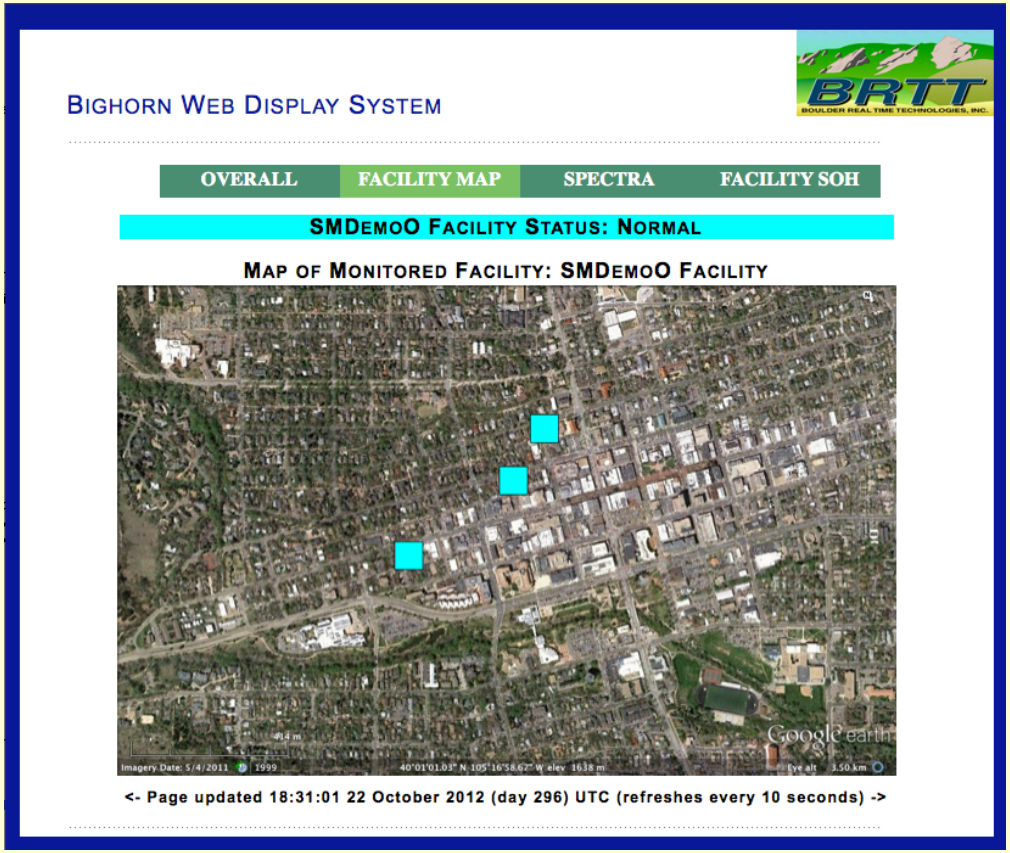
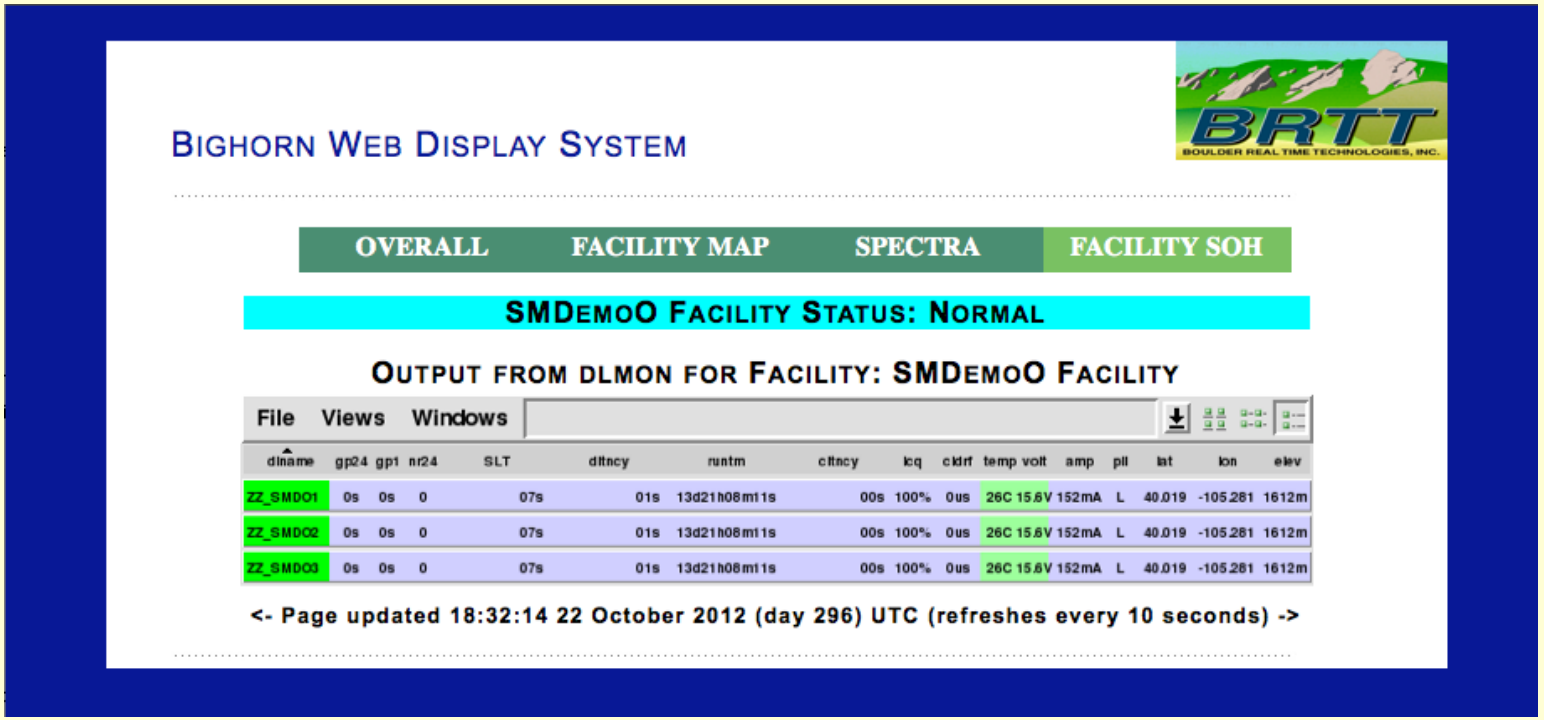
Bighorn Example: Facility Map



Bighorn Example: Stations *dlmon* for Facility



Bighorn Example: Stations *dlmon* for whole net

BIGHORN WEB DISPLAY SYSTEM

OVERALL | FACILITIES... | SOH

OVERALL STATUS: DATA PROBLEMS AT SMDEMOP, SMDEMOQ, SMDEMOR, SMDEMOD, SMDEMOE, SMDEMOG, SMDEMOA, SMDEMOB, SMDEMOC, SMDEMOO, SMDEMOH, SMDEMOI, SMDEMOJ

OUTPUT FROM DLMON FOR BIGHORN SYSTEM

File Views Windows

dlname	gp24	gp1	nr24	SLT	dltncy	runtm	cltncy	lcq	cldrf	temp	volt	amp	pll	lat	lon	elev
ZZ_SMDA1	0s	0s	0	02s	01s	14d00h31m40s	00s	100%	0us	25C	15.6V	159mA	L	40.019	-105.281	1620m
ZZ_SMDA2	0s	0s	0	02s	01s	14d00h31m40s	00s	100%	0us	25C	15.6V	159mA	L	40.019	-105.281	1620m
ZZ_SMDA3	0s	0s	0	02s	01s	14d00h31m40s	00s	100%	0us	25C	15.6V	159mA	L	40.019	-105.281	1620m
ZZ_SMDB1	0s	0s	0	02s	01s	14d00h31m40s	00s	100%	0us	25C	15.6V	159mA	L	40.019	-105.281	1620m
ZZ_SMDB2	0s	0s	0	02s	01s	14d00h31m40s	00s	100%	0us	25C	15.6V	159mA	L	40.019	-105.281	1620m
ZZ_SMDB3	0s	0s	0	02s	01s	14d00h31m40s	00s	100%	0us	25C	15.6V	159mA	L	40.019	-105.281	1620m
ZZ_SMDC1	0s	0s	0	02s	01s	14d00h31m40s	00s	100%	0us	25C	15.6V	159mA	L	40.019	-105.281	1620m
ZZ_SMDC2	0s	0s	0	02s	01s	14d00h31m40s	00s	100%	0us	25C	15.6V	159mA	L	40.019	-105.281	1620m
ZZ_SMDC3	0s	0s	0	02s	01s	14d00h31m40s	00s	100%	0us	25C	15.6V	159mA	L	40.019	-105.281	1620m
ZZ_SMDD1	0s	0s	0	02s	01s	14d00h31m40s	00s	100%	0us	25C	15.6V	159mA	L	40.019	-105.281	1620m
ZZ_SMDD2	0s	0s	0	02s	01s	14d00h31m40s	00s	100%	0us	25C	15.6V	159mA	L	40.019	-105.281	1620m
ZZ_SMDD3	0s	0s	0	02s	01s	14d00h31m40s	00s	100%	0us	25C	15.6V	159mA	L	40.019	-105.281	1620m
ZZ_SMDE1	0s	0s	0	02s	01s	14d00h31m40s	00s	100%	0us	25C	15.6V	159mA	L	40.019	-105.281	1620m
ZZ_SMDE2	0s	0s	0	02s	01s	14d00h31m40s	00s	100%	0us	25C	15.6V	159mA	L	40.019	-105.281	1620m
ZZ_SMDE3	0s	0s	0	02s	01s	14d00h31m40s	00s	100%	0us	25C	15.6V	159mA	L	40.019	-105.281	1620m
ZZ_SMDF1	0s	0s	0	02s	01s	14d00h31m40s	00s	100%	0us	25C	15.6V	159mA	L	40.019	-105.281	1620m
ZZ_SMDF2	0s	0s	0	02s	01s	14d00h31m40s	00s	100%	0us	25C	15.6V	159mA	L	40.019	-105.281	1620m
ZZ_SMDF3	0s	0s	0	02s	01s	14d00h31m40s	00s	100%	0us	25C	15.6V	159mA	L	40.019	-105.281	1620m
ZZ_SMDG1	0s	0s	0	02s	01s	14d00h31m40s	00s	100%	0us	25C	15.6V	159mA	L	40.019	-105.281	1620m
ZZ_SMDG2	0s	0s	0	02s	01s	14d00h31m40s	00s	100%	0us	25C	15.6V	159mA	L	40.019	-105.281	1620m
ZZ_SMDG3	0s	0s	0	02s	01s	14d00h31m40s	00s	100%	0us	25C	15.6V	159mA	L	40.019	-105.281	1620m
ZZ_SMDH1	0s	0s	0	02s	01s	14d00h31m40s	00s	100%	0us	25C	15.6V	159mA	L	40.019	-105.281	1620m
ZZ_SMDH2	0s	0s	0	02s	01s	14d00h31m40s	00s	100%	0us	25C	15.6V	159mA	L	40.019	-105.281	1620m
ZZ_SMDH3	0s	0s	0	02s	01s	14d00h31m40s	00s	100%	0us	25C	15.6V	159mA	L	40.019	-105.281	1620m
ZZ_SMDI1	0s	0s	0	02s	01s	14d00h31m40s	00s	100%	0us	25C	15.6V	159mA	L	40.019	-105.281	1620m
ZZ_SMDI2	0s	0s	0	02s	01s	14d00h31m40s	00s	100%	0us	25C	15.6V	159mA	L	40.019	-105.281	1620m
ZZ_SMDI3	0s	0s	0	02s	01s	14d00h31m40s	00s	100%	0us	25C	15.6V	159mA	L	40.019	-105.281	1620m
ZZ_SMDJ1	0s	0s	0	02s	01s	14d00h31m40s	00s	100%	0us	25C	15.6V	159mA	L	40.019	-105.281	1620m
ZZ_SMDJ2	0s	0s	0	02s	01s	14d00h31m40s	00s	100%	0us	25C	15.6V	159mA	L	40.019	-105.281	1620m
ZZ_SMDJ3	0s	0s	0	02s	01s	14d00h31m40s	00s	100%	0us	25C	15.6V	159mA	L	40.019	-105.281	1620m
ZZ_SMDK1	0s	0s	0	02s	01s	14d00h31m40s	00s	100%	0us	25C	15.6V	159mA	L	40.019	-105.281	1620m

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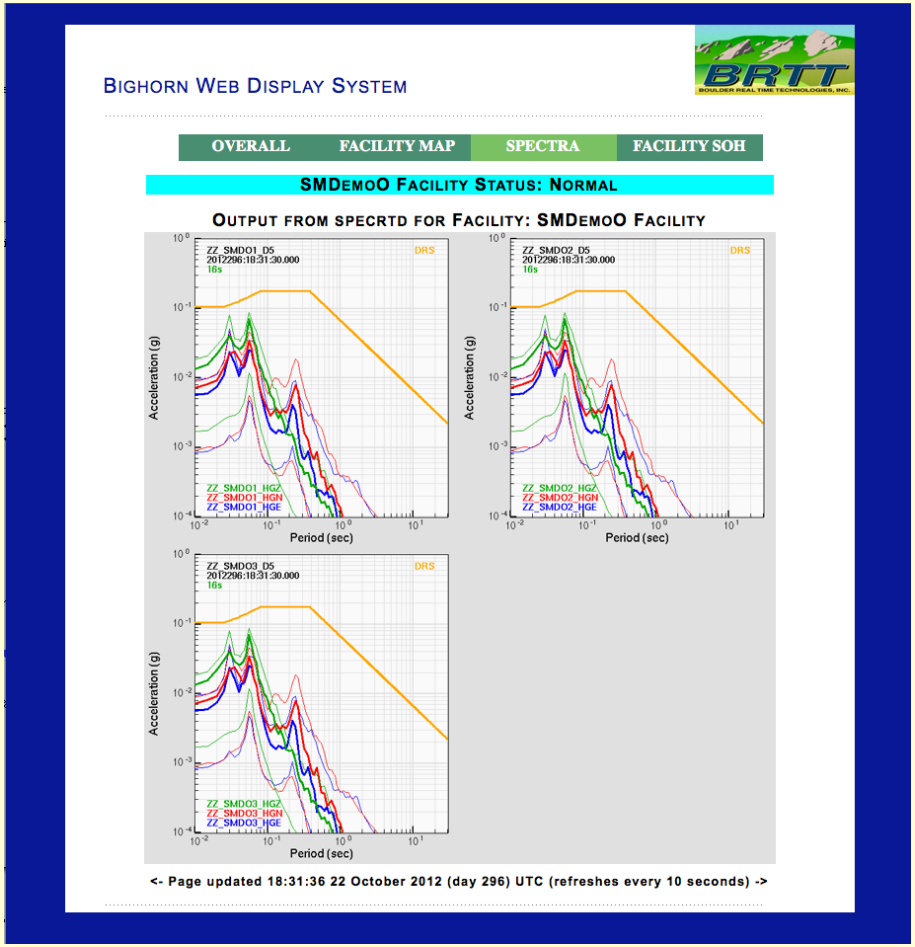
Bighorn Example: Real-time Spectral Display



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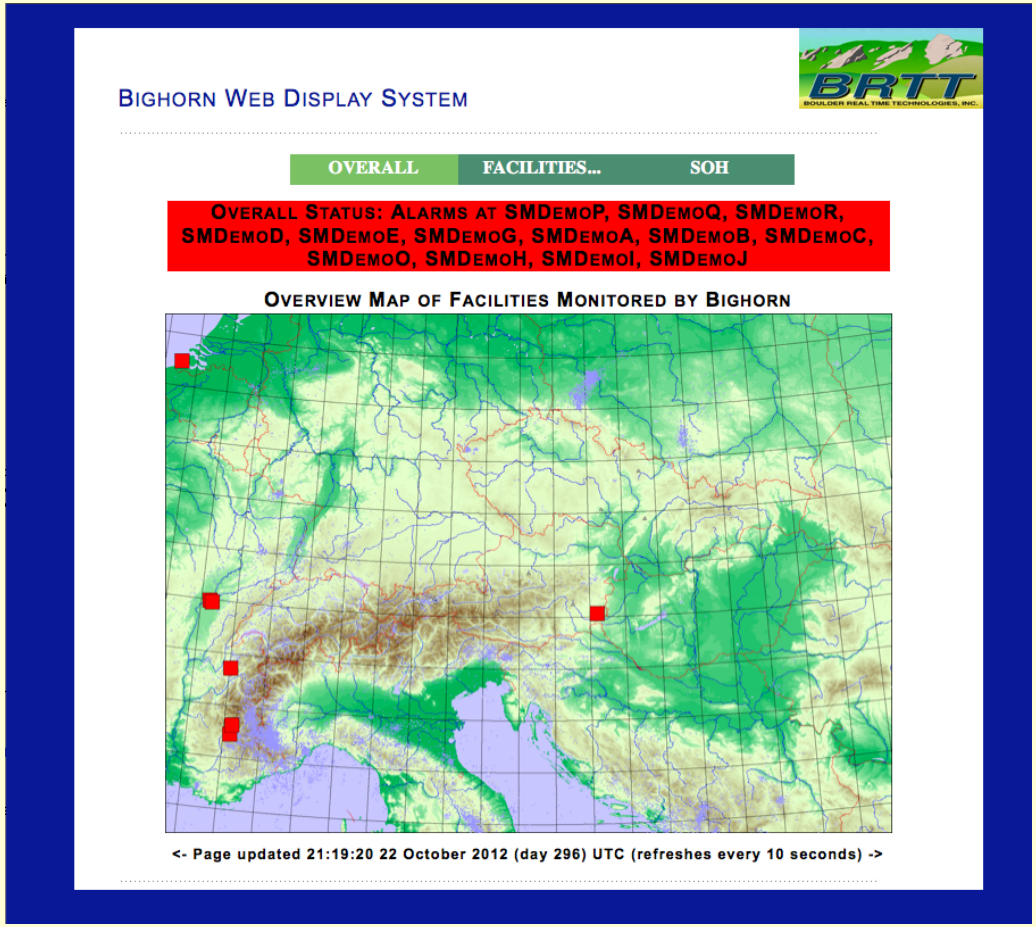
Bighorn Example: Spectral Exceedence Alarm



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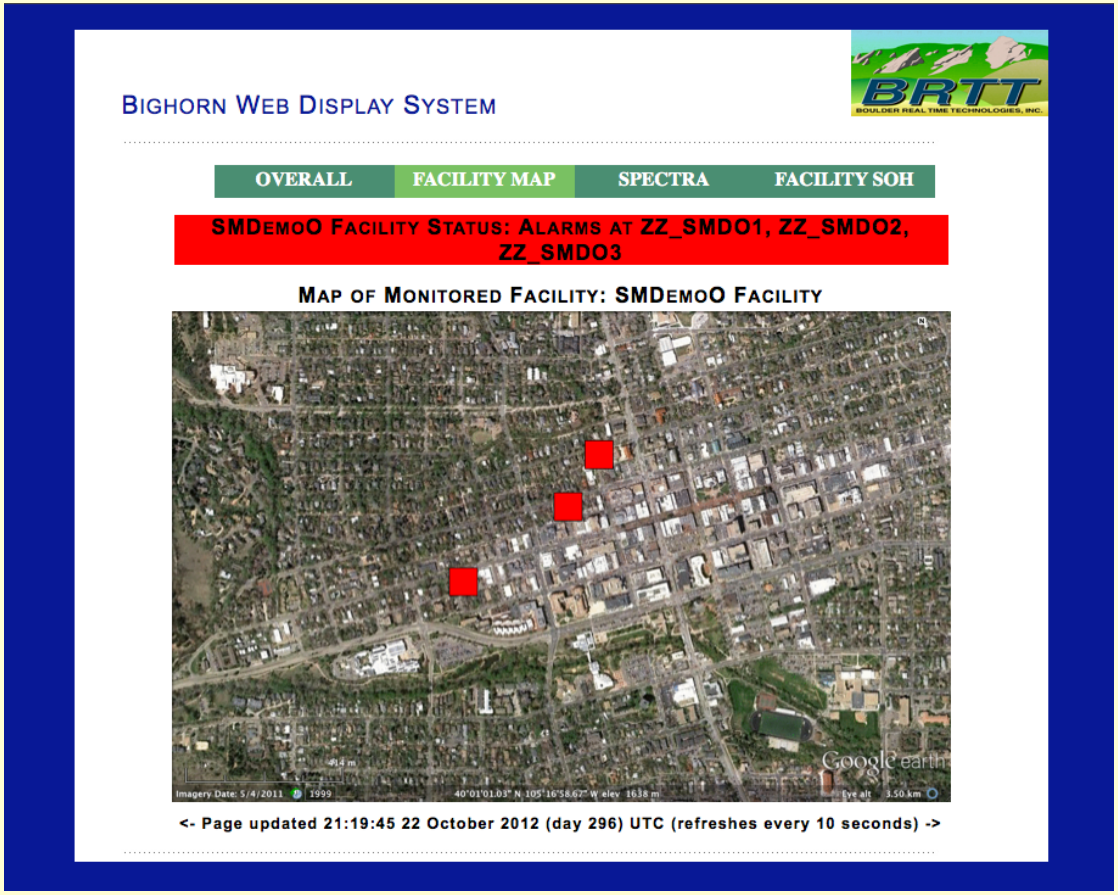
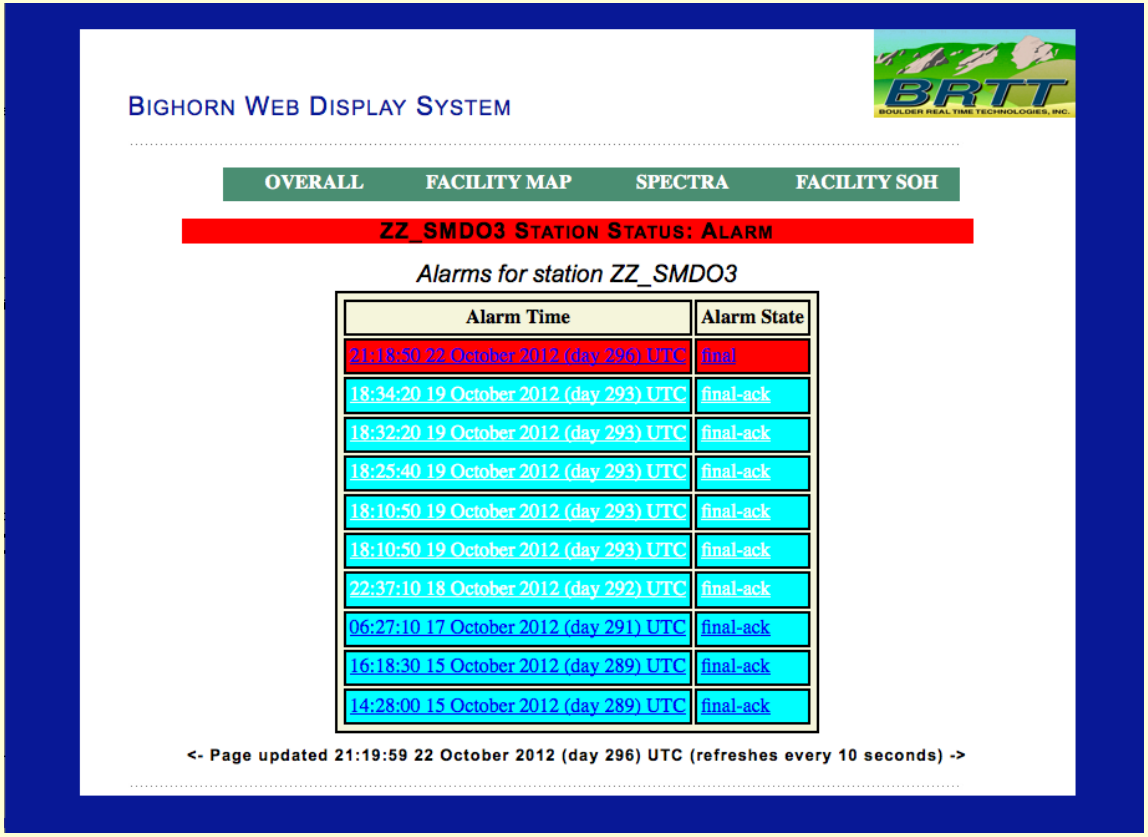
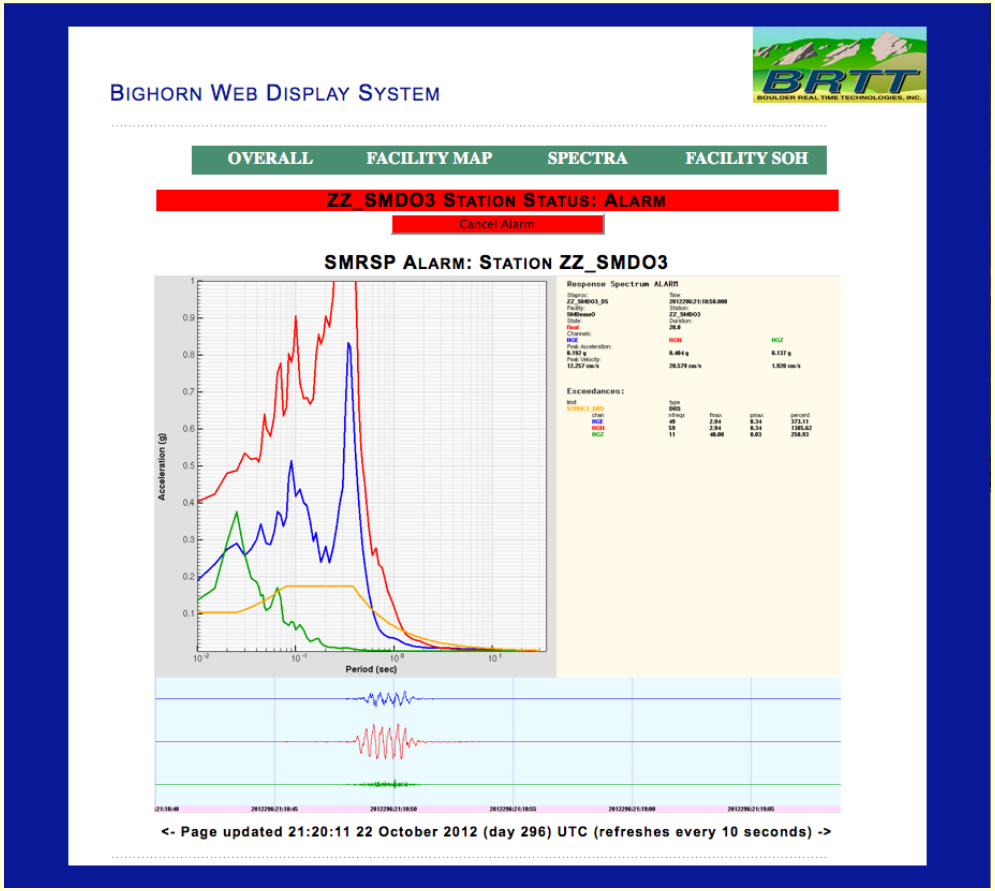
Bighorn Example: Facility Exceedence Alarm



Bighorn Example: Station Alarms Page



Bighorn Example: Alarm Report and Acknowledgment



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Bighorn Example: Alarm Details

Response Spectrum ALARM

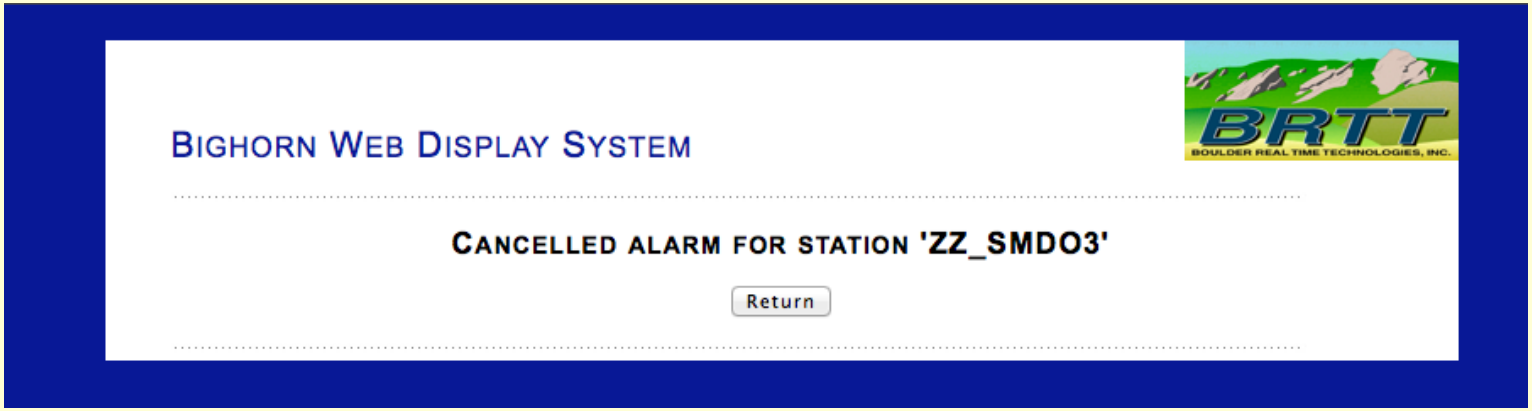
Staproc:	Time:	
ZZ_SMDO3_D5	**2012296:21:18:50.000**	
Facility:	Station:	
SMDemoO	**ZZ_SMDO3**	
State:	Duration:	
final	**20.0**	
Channels:		
HGE	**HGN**	**HGZ**
Peak Acceleration:		
0.192 g	**0.404 g**	**0.137 g**
Peak Velocity:		
12.257 cm/s	**20.579 cm/s**	**1.920 cm/s**

Exceedances:

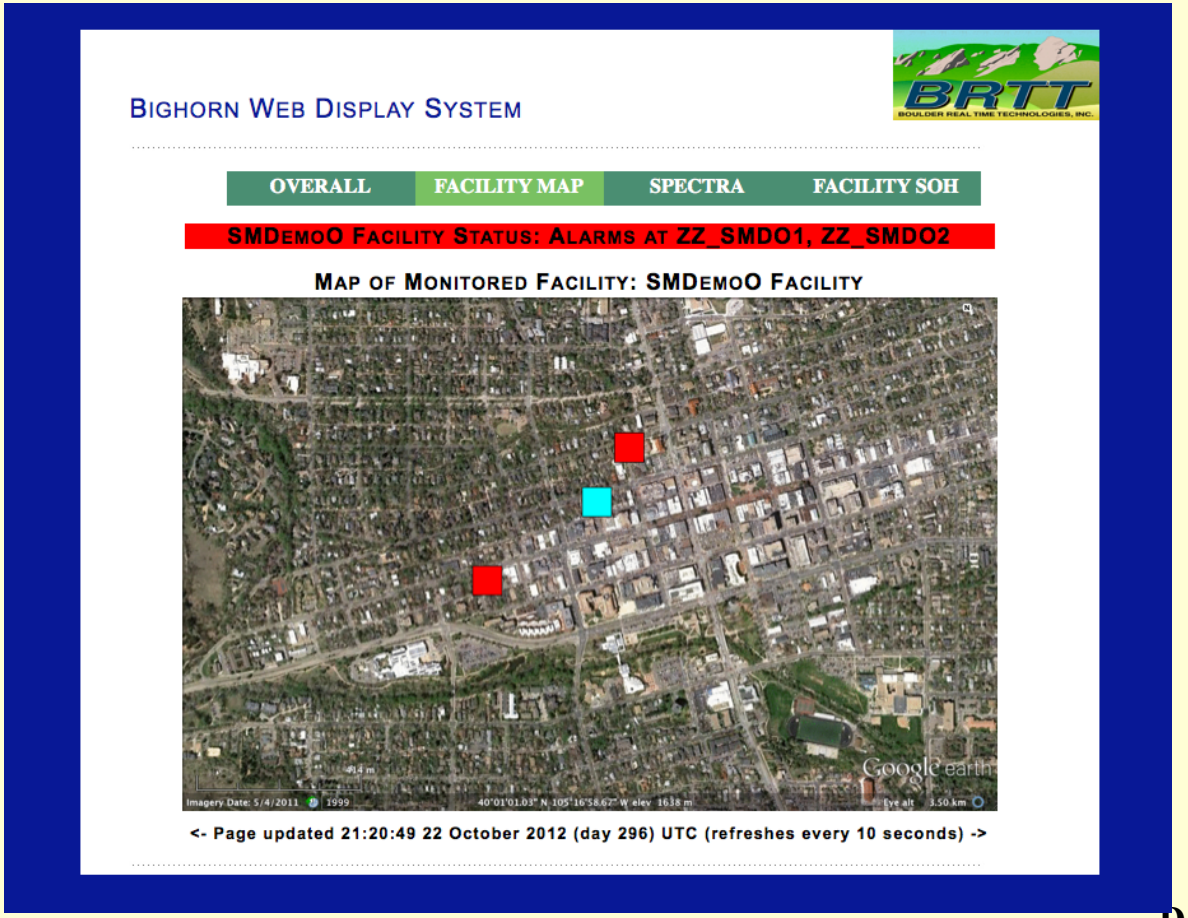
limit **STRUC1_DRS** type **DRS**

chan	nfreqs	fmax	pmax	percent
HGE	**49**	**2.94**	**0.34**	**373.11**
HGN	**59**	**2.94**	**0.34**	**1385.62**
HGZ	**11**	**40.00**	**0.03**	**258.93**

Bighorn Example: Confirmed Alarm Cancellation



Bighorn Example: Dynamic updates from database



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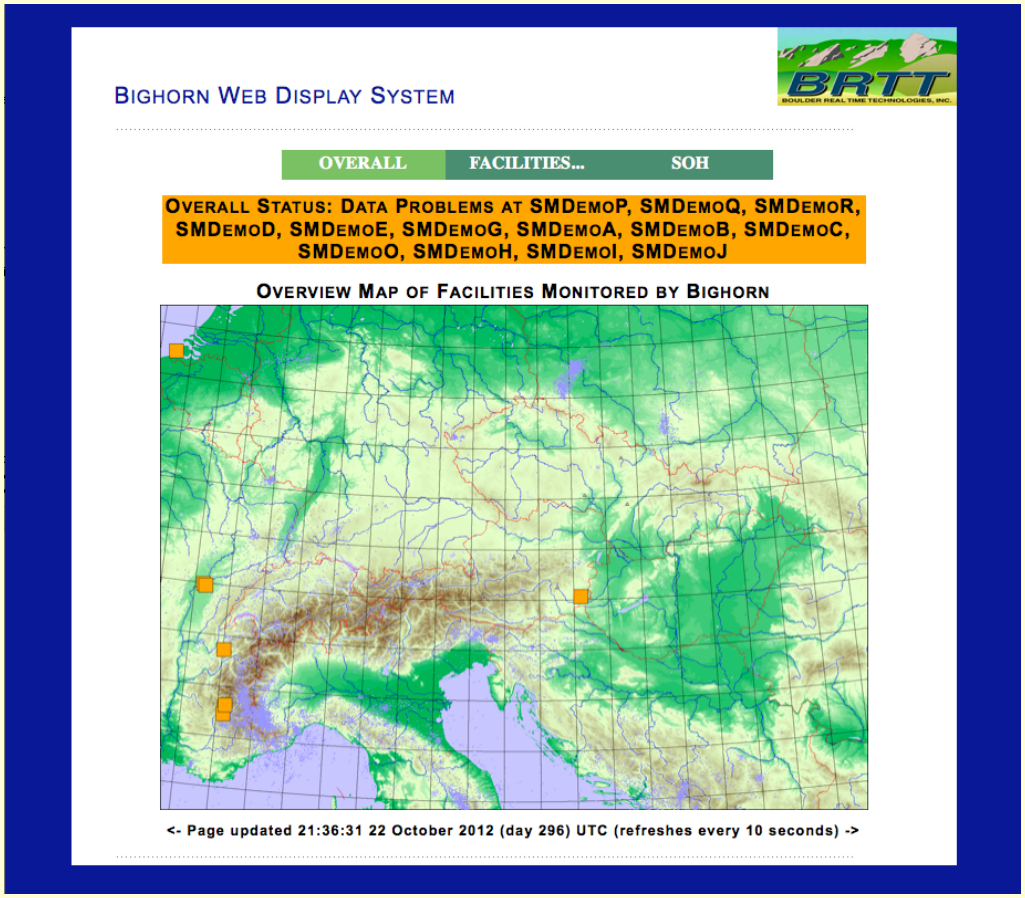
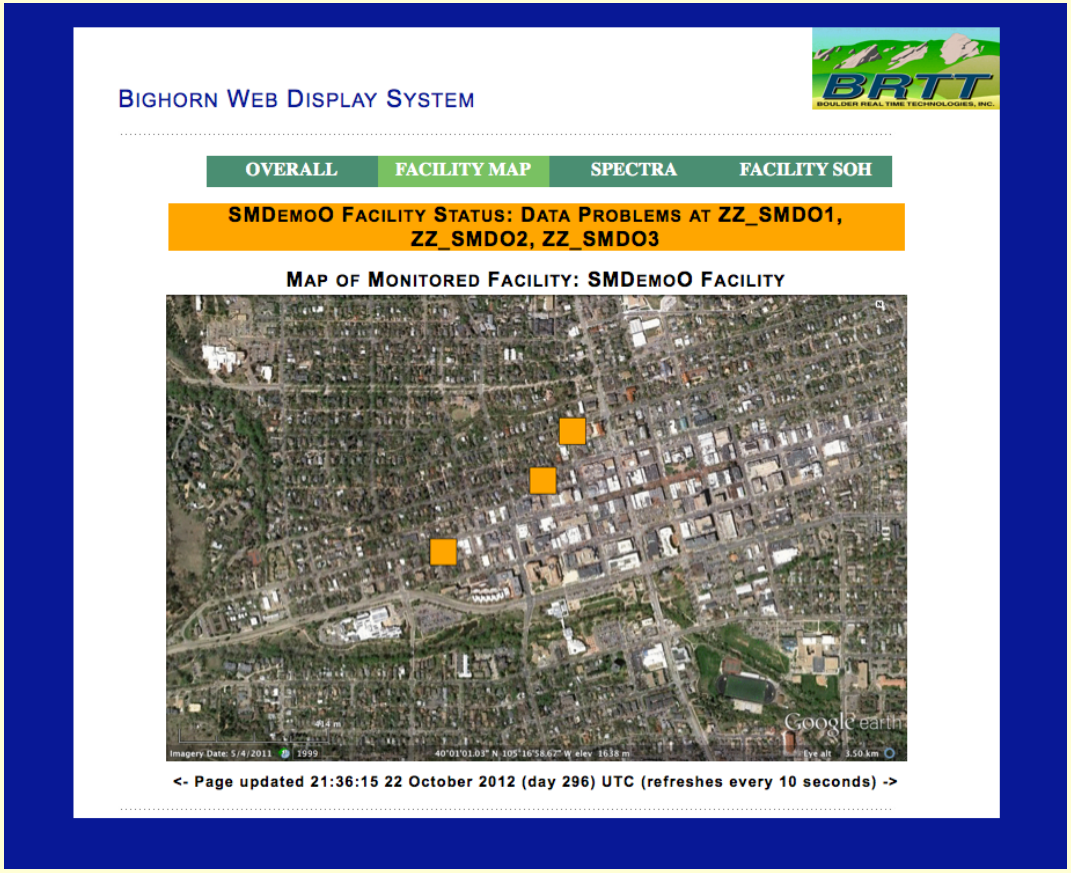
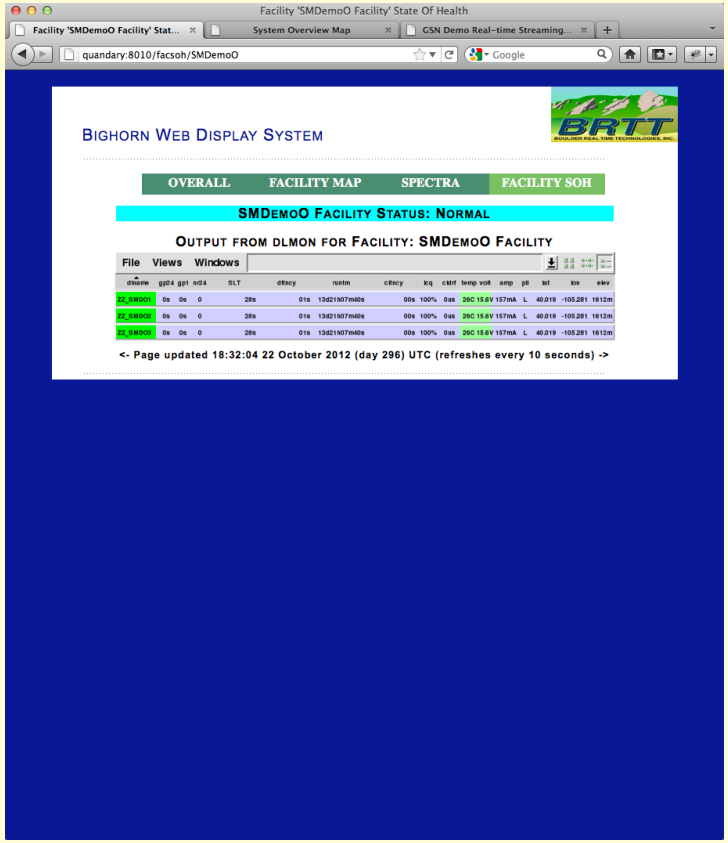
Bighorn Example: Data Problem Detection



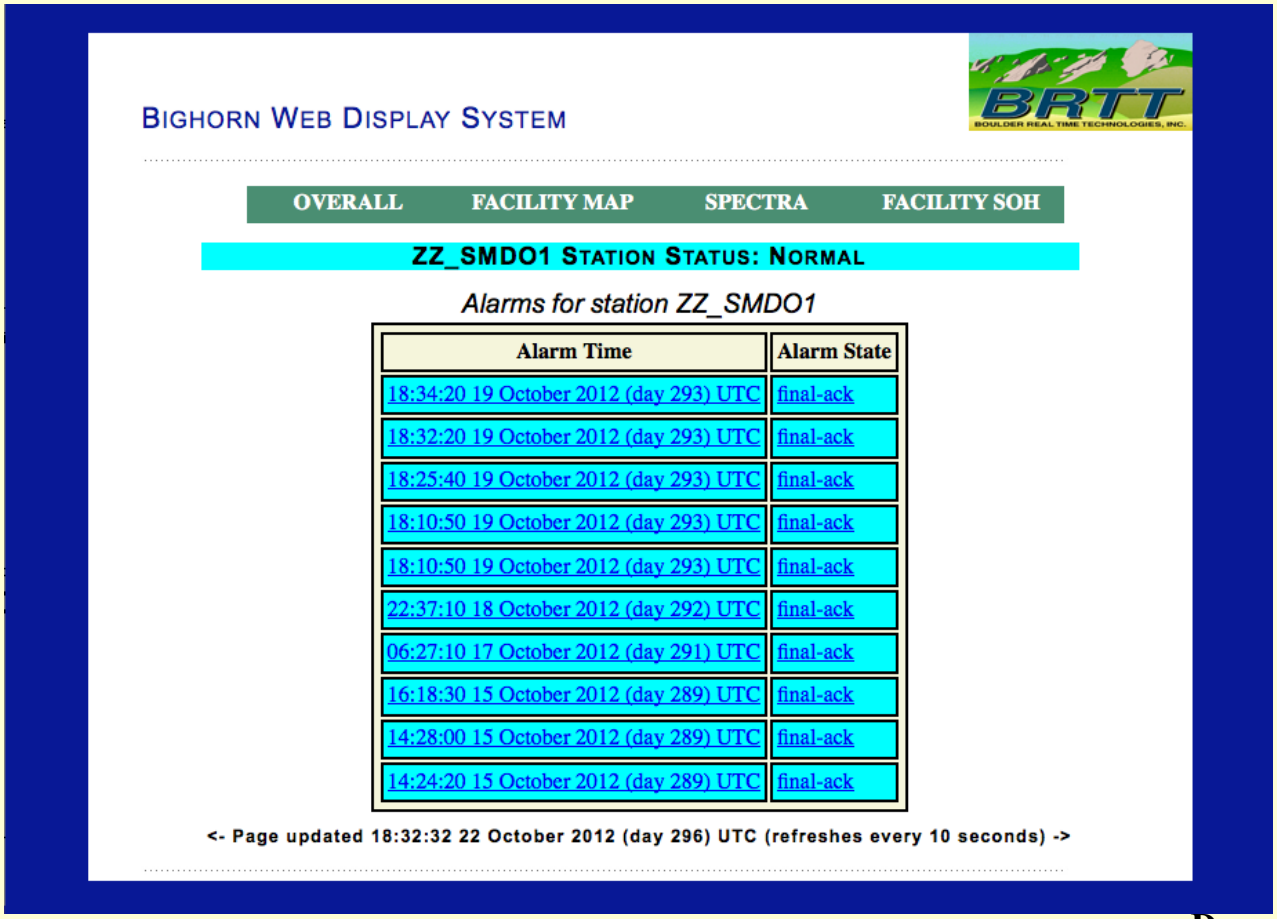
Bighorn Example: Data Problem Detection



Bighorn Example: Data Problem Analysis



Bighorn Example: Historic Report Exploration



BIGHORN WEB DISPLAY SYSTEM

OVERALL | FACILITY MAP | SPECTRA | FACILITY SOH

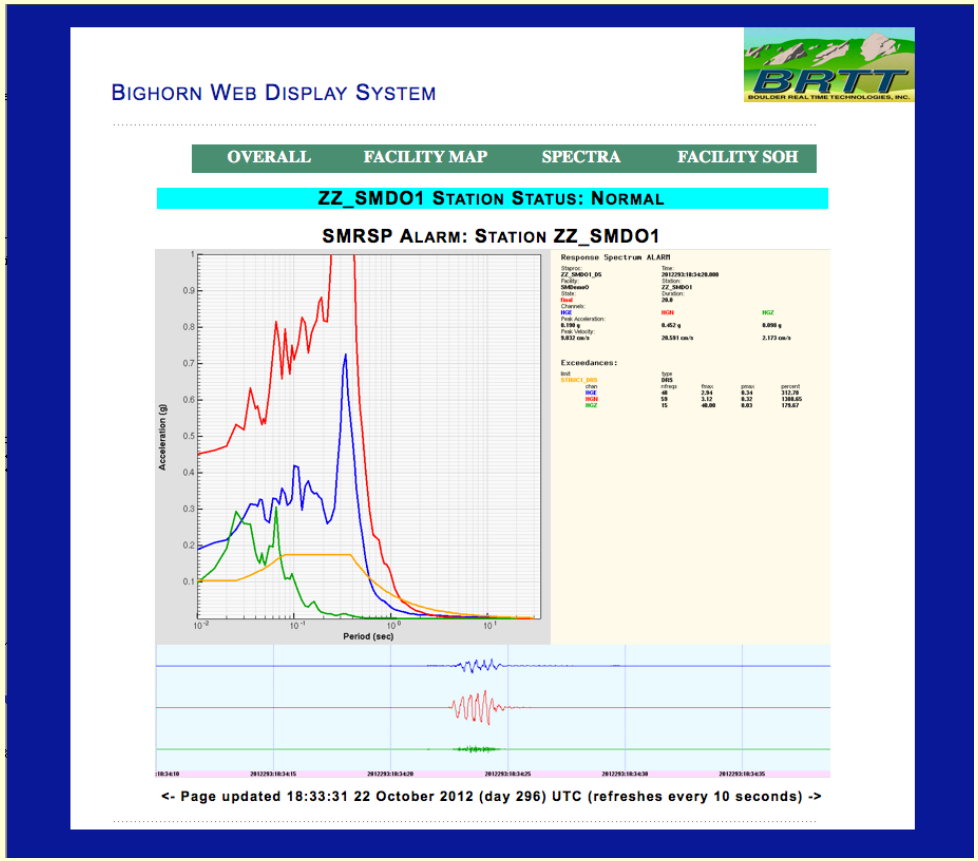
ZZ_SMDO1 STATION STATUS: NORMAL

Alarms for station ZZ_SMDO1

Alarm Time	Alarm State
18:34:20 19 October 2012 (day 293) UTC	final-ack
18:32:20 19 October 2012 (day 293) UTC	final-ack
18:25:40 19 October 2012 (day 293) UTC	final-ack
18:10:50 19 October 2012 (day 293) UTC	final-ack
18:10:50 19 October 2012 (day 293) UTC	final-ack
22:37:10 18 October 2012 (day 292) UTC	final-ack
06:27:10 17 October 2012 (day 291) UTC	final-ack
16:18:30 15 October 2012 (day 289) UTC	final-ack
14:28:00 15 October 2012 (day 289) UTC	final-ack
14:24:20 15 October 2012 (day 289) UTC	final-ack

<- Page updated 18:32:32 22 October 2012 (day 296) UTC (refreshes every 10 seconds) ->

Bighorn Example: Historic Report Display



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Thank You

- For Purchase Information on Bighorn, contact Ogie Kuraica at Kinemetrics, Inc.
  - ogie@kmi.com