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NOISE CENTER OF THE LEAGUE

NOISE & HEALTH FACT SHEET

Noise Harms More Than Our Ears

Continued exposure to loud noise will cause hearing loss. (See Noise Center's Fact Sheet on Noise and Hearing). Exposure to noise, or unwanted sound, however, is far more than just a threat to our ears. William H. Stewart, former U.S. Surgeon General, stated, "Calling noise a nuisance is like calling smog an inconvenience. Noise must be considered a hazard to the health of people everywhere." Studies have correlated noise with physiological changes in sleep, blood pressure and digestion. Studies have also linked noise with a negative impact on the developing fetus.

Noise & Sleep

According to Alice Suter, noise expert, noise is one of the most common forms of sleep disturbance and when sleep disruption becomes chronic, adverse health effects are great. Research shows that intermittent and impulsive noise is more disturbing than continuous noise. The Environmental Protection Agency identified an indoor day-night average sound level (DNL) of 45 dBA (equivalent to a night-time average sound level of 35 dBA) to protect against sleep disturbance.

Converter @ 62 dBA

Noise & Cardiovascular Changes

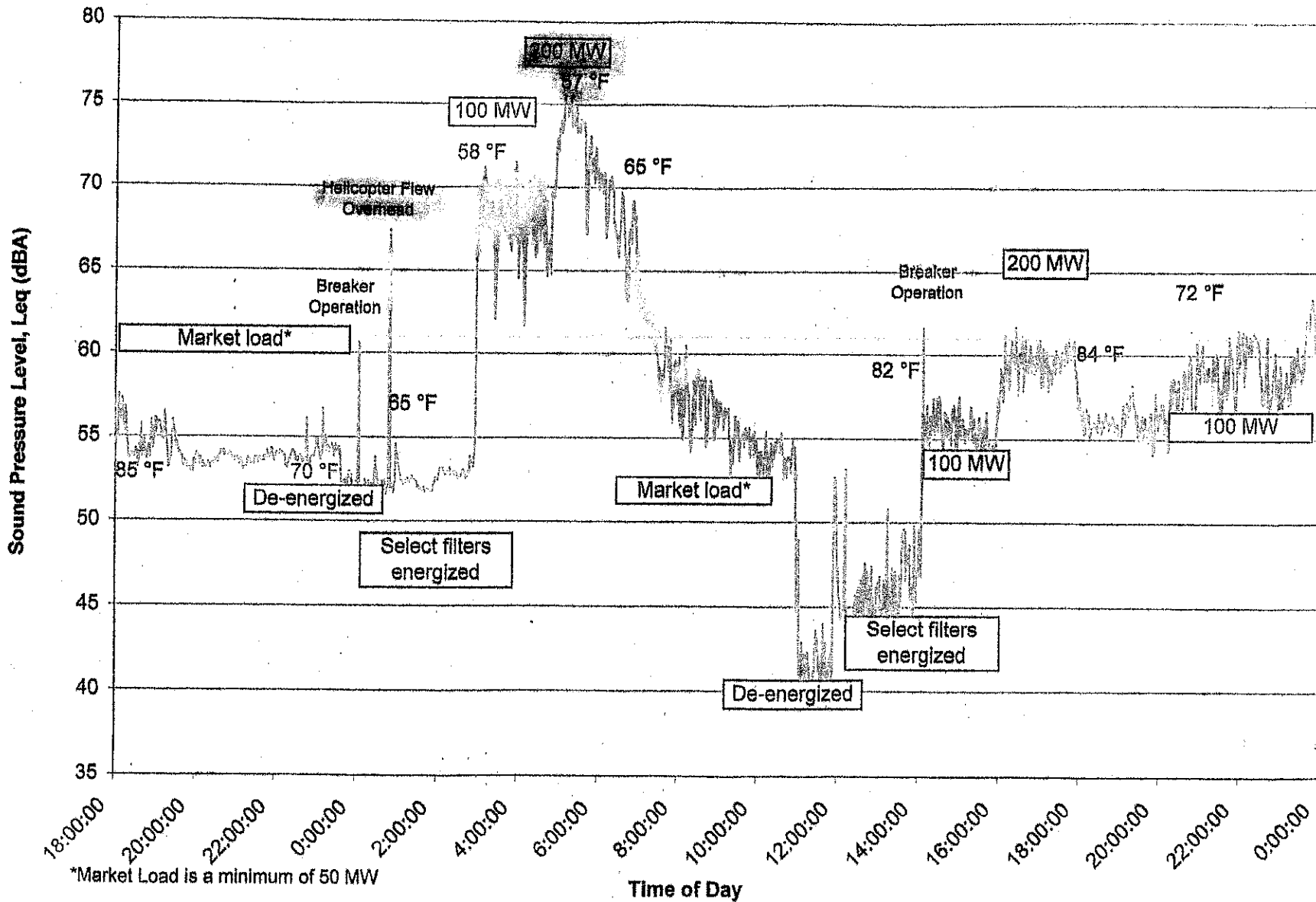
Studies show that exposure to noise is associated with elevations in blood pressure. There is some disagreement as to whether or not these changes are permanent or temporary. Rehm (1983) reported increased levels of epinephrine and norepinephrine suggesting cardiovascular involvement. Rehm also found a correlation beyond noise annoyance and adverse cardiovascular effects.

Noise & Gastrointestinal Changes

Studies have linked noise exposure with increased gastric emptying (Kaus & Fell, 1984), with increased peristaltic esophageal contraction (Young, 1987), as well as increased anxiety. Another study found an increase in the use of antacids and hypnotics, sedatives and antihypertensives in a noisy community, as compared to a quiet community (Knapchild, 1977).

Noise & Annoyance

Figure 2: 30-Hour Noise Study



Closed Circuit, Oct. 10, 2003, Vol. 25 No. 21

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Rapid City station ties grids together

Wyoming might be sparsely populated, but an increased demand for power there is fueling the need for a new interconnection between the eastern and western power grids near Rapid City, S.D.

The Rapid City DC tie will be used primarily to import energy from the eastern grid to serve loads in Wyoming. Much of this new load growth is due to coal bed methane gas development that requires power to pump the coal bed water out and compress the methane gas.

Before the new DC converter station goes live Oct. 15, RM staff must test the Supervisory Control and Data Acquisition System to make sure that power can be successfully transferred across the two grids. "This is a big deal," said **Chuck Weaver**, RM's lead transmission switching dispatcher. "DC stations have different controls, and you have to change the direction and speed of ramp to convert the current from AC to DC to AC. It's more than just opening and closing breakers."

The Rapid City DC tie is one of six interconnections that join the eastern and western U.S. power grids. Converter stations act as giant shock absorbers, converting AC power on one side of the grid to DC, then back to AC. DC converters allow energy to flow reliably between grids, but maintain the electrical separation so that a disturbance on one side won't affect the other. Access to power from the other grid allows utilities to delay powerplant construction while meeting peak demand more economically by buying the needed energy.

While the other five DC ties use a single converter to transfer electrical capacity from east to west or from west to east, the Rapid City DC tie has two 100-MW converters connected in parallel. "This allows maintenance crews to work on one converter without cutting off the power flow completely," explained Weaver. "Converter station owners Basin Electric Power Cooperative and Black Hills Power Corp. can ensure they always have 100 MW to feed into the load area." Asea Utilities, from Ludvika, Sweden, is constructing the DC tie using technology known as a capacitor commutated converter. These capacitors between the valve hall and the converter transformers produce reactive power in proportion to the current. This means that the station won't have to rely as much on the interconnected AC system to provide reactive power for the DC tie.

When Western customer Basin Electric and Black Hills struck a deal in late 2001 to construct the 200-MW bi-directional DC tie, they were preparing for load growth in northeastern Wyoming.

Under the arrangement, Basin Electric will own 65 percent of the project and Black Hills will own the remaining 35 percent. In May 2002, Basin Electric and Black Hills requested that Western operate the Rapid City DC tie for them. RM agreed to be the primary operator of the tie as part of its Western Area Colorado/Missouri control area.

Western will operate four of the six DC ties connecting the eastern and western grids, when the new Rapid City tie becomes operational next week. The other DC ties Western operates are in Miles City, Mont., Stegall, Neb. and Sidney, Neb.

(Note: Bob Easton, RM's Operations Engineering and Planning manager, contributed to this story.)

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Saturday, February 11, 2006

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Intertie measure meets no resistance

Intertie measure meets no resistance

By Dan Daly, Journal Staff Writer

RAPID CITY - A bill to give the Public Utilities Commission more control over where and how to build electrical "intertie" facilities — such as the station that has been annoying its neighbors south of Rapid City since October 2003 — has met no resistance in the South Dakota Legislature.

SB24 was introduced by the Senate Commerce Committee on behalf of the PUC. It has passed without a single no vote through the Senate committee, the full Senate and, on Thursday, the House Commerce Committee. It's awaiting action by the full House. No opposition is expected.

PUC Commissioner Dustin "Dusty" Johnson said big electrical stations such as the Rapid City intertie should go through the same industrial siting process that power plants must go through.

"In the past, it was sited like a transmission line, which is not a very intensive process," Johnson said. "This was a \$70 million facility. It's not like a transmission line. It's a lot more like a power plant."

The United States is divided by two vast electrical networks, and the line between the eastern and western grids runs just east of Rapid City. To move electricity between east and west, the alternating current electricity must be converted to direct current, then back to AC on the other side of the divide.

The \$70 million intertie south of Rapid City does just that. Owned jointly by Basin Electric Cooperative and Black Hills Power, it was completed in October 2003.

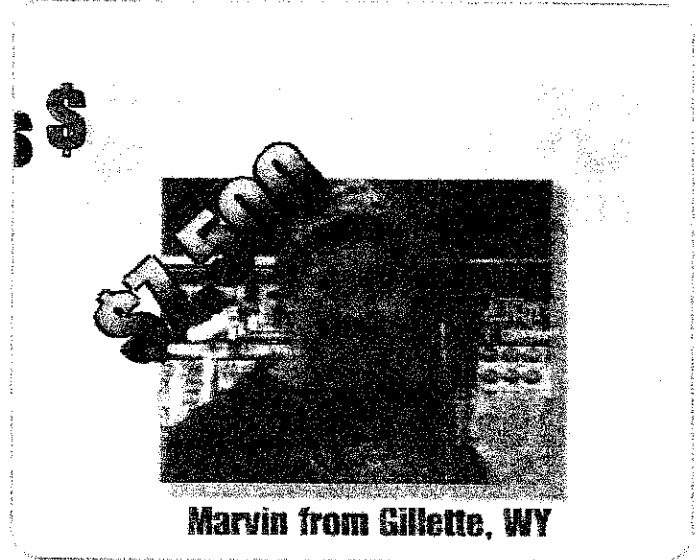
Almost immediately, nearby residents began complaining of a loud humming noise. Steps have been taken to reduce the noise, but residents a mile away have said the humming persists.

"The complaint that resonated the most with me is that people say they didn't get an opportunity to understand the magnitude of the project," Johnson said.

The bill has the support of the utility industry. Ed Anderson of the South Dakota Rural Electric Association said Friday that his group has supported SB24 at every step through the Legislature.

"Basin Electric is one of our members, and one of the owners of the Rapid City intertie," Anderson said. "They have no problem with complying. In many cases, the people who end up being near these projects are co-op members. We're very member-oriented, and it's important to make sure they do it right."

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Under the new measure, the utilities building the facility would have to apply for a permit six months in advance. The utilities would also have to notify in writing everyone within half a mile of the proposed site. They would also post signs and publish notices in the newspaper.

The PUC would appoint a local review committee of mayors, school board officials, county commissioners and tribal chairmen in affected areas, as well as utility officials.

The committee would have public hearings, consult with independent experts and make recommendations to the PUC.

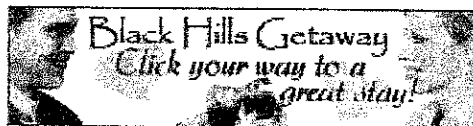
If SB24 had been in effect before the Rapid City project began, Johnson said, it's hard to tell whether today's problems would have been prevented. A lot depends on vagaries of topography and location.

"We don't know what a local review might have done, but we give a lot of deference to those recommendations," he said. "It's possible that we could have looked at alternative locations or alternative designs."

Contact Dan Daly at 394-8421 or dan.daly@rapidcityjournal.com

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Senate Bill 24		
The Committee on Commerce at the request of the Public Utilities Commission		
An Act to revise certain provisions concerning the authority of the Public Utilities Commission with regard to AC/DC conversion projects and energy conversion facilities.		
Subject Index: Energy , Public Utilities and Carriers		
Date	Action	
01/10/2006	First read in Senate and referred to Senate Commerce S.J. 18	▼
01/17/2006	Scheduled for committee hearing on this date	▼
01/17/2006	Commerce Do Pass Passed, YEAS 7, NAYS 0. S.J. 80	▼
01/18/2006	Senate Do Pass Passed, YEAS 33, NAYS 0. S.J. 96	▼
01/19/2006	First read in House and referred to House Commerce H.J. 148	
02/07/2006	Scheduled for committee hearing on this date	
02/09/2006	Scheduled for committee hearing on this date	▼
02/09/2006	Commerce Do Pass Passed, YEAS 13, NAYS 0. H.J. 467	▼
02/09/2006	Commerce Place on Consent Calendar	▼
02/10/2006	House of Representatives Do Pass Passed, YEAS 68, NAYS 0. H.J. 512	
02/13/2006	Signed by Speaker H.J. 552	
02/13/2006	Signed by President S.J. 500	
02/14/2006	Delivered to the Governor S.J. 508	
02/17/2006	Signed by Governor S.J. 570	

Bill Text Versions		
Date	HTML Version	Acrobat Version
01/07/2006	As Introduced	As Introduced
02/13/2006	Enrolled	Enrolled

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Last Updated: 3/24/2006 2:13:17 PM

Noise: Decibel levels

From Page B1

The Millers and neighbors have been trying to get something done about the noise for months. In March, they submitted petitions to local governing bodies, the PUC and the utility companies seeking a resolution, but progress has been slow.

For the past month, the issue has been a weekly topic of discussion by the Pennington County Commission. The commission has scheduled an Aug. 3 review of the conditional-use permit for the facility.

Jim Keck of Black Hills Power told county commissioners last week that the station's designer and contractor, ABB, is looking at the station's equipment to make sure it's running properly and is also looking at potential ways to bring the noise under the permitted level. Recent tests conducted on behalf of the utility have shown decibel levels at the fence line higher than the 62 decibels allowed by the PUC.

Sahr said expects to have the results from ABB by Wednesday, and he recommended neighbors wait until they see those results before they decide on their next steps.

"In two days, they should have a report that makes some kind of recommendation. I'm going to be curious about what corrections they're proposing and if we can tell from that how long it will take to get it in place," Sahr said.

However, if homeowners aren't satisfied with the report, they might decide to file a complaint with the PUC that would lead to a hearing in which both sides present their case to the

commission and ask for a solution. Other options could include continuing to work with the county toward a resolution or taking the matter to court.

Sahr said he intends to take his first-hand experience, as well as what he heard from landowners and public officials, back to the PUC to figure out what sort of help can be offered and to provide landowners with options. Above all, he wants to move the process along more quickly than it had been previously.

After the meeting, homeowners said they appreciated Sahr's visit but wondered whether it will really lead to a resolution.

"My feeling is he's sincere, but his hands are tied," said Kelly Faulk, who lives east of the Millers at the corner of Lamb and Old Polson Road.

"And the bureaucracy is probably going to tie it up. As homeowners, we don't have the time or the money. Time is on their side, money is on their side. They have the upper hand," Faulk said.

Jacki Miller said she is still frustrated but is glad Sahr took the time to see for himself. She said she and her husband tried to take the high road to resolve matters like neighbors do by asking the power companies to turn down the noise at night rather than immediately filing a complaint.

"We didn't come out with guns blazing. We came out asking them to turn it down at night," she said. "But still, it's like, what are we supposed to do? We really don't want to move. It's our home."

Contact Scott Aust at 394-8415 or scott.aust@rapidcityjournal.com

Roadless: Roads

From Page B1

Should the Forest Service be allowed to use koans?

Seeking enlightenment, I reached for the telephone.

Seventeen phone calls and two days later — after conversations with Forest Service

his name on a rock.

The "roadless inventory" also did not include wilderness areas, such as the Black Elk Wilderness in the Black Hills, which are actually more roadless than roadless areas.

The "inventory of roadless areas" also did not include

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PUC chairman takes a listen

Sahr investigates noise complaints

By Scott Aust
Journal Staff Writer

After roaming the countryside southeast of Rapid City early Monday morning, state Public Utilities Commission Chairman

Rapid City Bob Sahr said he has a better understanding of noise complaints associated with an AC-DC conversion station.

"This isn't your normal substation making a hum," Sahr said.

A joint venture by Black Hills Power and Basin Electric Cooperative, the \$70 million converter station is one of several huge interties that link the eastern and western electric grids in the United States.

Since the station came online last October, Duane and Jacki Miller say their sleep and lives have

been disrupted by an irritating noise they believe is coming from the intertie about three-fourths of a mile south of their Old Folsom Road home.

Neighbors also say they have been awakened by the noise. Mike Gould, who owns property next to the intertie and also has rentals nearby, said the noise seems to be worse now than it was over the winter.

"It's just a nonstop drone, a humming," he said.

Neighbors also say they feel a vibration.

"That can't be healthy," Gould said.

Sahr said he wanted to come out and experience the noise first hand. He arrived about 3:20 a.m. on Monday and stopped at five or six different locations around the station.

Although he could hear the noise well in several places, Sahr said he really "got it" when he stepped out on the upstairs porch outside the Millers' bedroom.

"With the windows shut, I could hear it. But when you told me you like to have your windows open and we stepped out on the porch, all I could think about was hearing that noise while trying to go to sleep," Sahr said to a gathering of neighbors in the Millers' home later Monday morning.

"I think it's almost the constant nature (of the noise) that really hit me. I was expecting a noise but to have it there all the time I can understand the problems you have with sleeping and trying to deal with it," Sahr said.

See **Noise**, Page B2



Steve McEnroe/Journal staff

South Dakota Public Utilities Commission Chairman Bob Sahr, second from right, speaks with property owners near the new converter station south of Rapid City on Monday morning. From left are Kelly Faulk, Jacki Miller, PUC analyst Steve Wegman, an unidentified PUC staff member, Sahr and Duane Miller.