

Agenda Date: February 7, 2007
Item Number: A1

Docket: UT-063060

Company Name: Bellingham Cellular Partnership; Bremerton Cellular Telephone Company; Hood River Cellular Telephone Company, Inc.; New Cingular Wireless PCS, LLC; and Olympic Cellular Telephone Company, Inc. (collectively Cingular)

Staff: Bob Shirley, Telecommunications Policy Analyst

Recommendation

Deny Cingular's request for a permanent exemption from WAC 480-123-070(6). Grant an exemption for five years to the battery power requirements of WAC 480-123-070(6) for all Cingular cell sites, subject to the following conditions: (1) require Cingular to place four hours of back-up power when building new cell sites; and (2) require Cingular to increase to four hours the amount of back-up power at all Priority 1 and -98 db cell sites that now have less than 3.75 hours of battery power.

Background

Cingular seeks a permanent exemption from WAC 480-123-070(6) (the requirement that it have at least four hours of battery power at each cell site) because 80 percent of its cell sites have less than four hours of battery power.

In the alternative, Cingular seeks a permanent, partial exemption to permit it to increase power to at least four hours to selected cell sites using both battery and fixed-generator power.¹ Cingular suggests seven options for permanent, partial exemptions (the options and costs are listed in Table 1 at the end of this memo). If the permanent exemption is not granted, Cingular requests it be given two years to add power to cell sites.

Cingular states in its request for exemption that it will include four hours of power at all newly built cell sites even if it is granted the permanent exemption, and that it also plans to increase to four hours the amount of power at Priority 1 and -98 db² cell sites.

Discussion

A. Legal Standard for Granting a Temporary Exemption

The legal standard the commission has used to grant temporary exemptions from rules is that it may do so when granting the exemption is not inconsistent with the purposes underlying regulation, the applicable statutes, and the public interest.³

¹ Cingular is experimenting with hydrogen fuel cells as an option for supplying back-up power at cell sites.

² Cingular describes these two types of sites in footnote three to its confidential Exhibit A. A cell site with -98 db coverage is generally considered to be a stationary outdoor coverage site. Cingular designates cell sites "Priority 1" if they serve important locations such as hospitals and important government buildings.

³ See, for e.g., dockets UT-063066; UT-05116, UT-051330, UT-051488.

B. Summary Analysis

The issue is whether the benefit to subscribers from requiring Cingular to add two hours of battery power at a large number of cell sites is worth the substantial cost that Cingular would incur. Federal high-cost support expended to increase battery power would not be available to increase capacity or coverage that serves subscribers.

Cingular advances two arguments in favor of its request for permanent exemption to WAC 480-123-070(6). Cingular argues that the permanent exemption is warranted (1) because Cingular provides sufficient power at cell sites through batteries and fixed and mobile generators to operate its cell sites in all but extreme, major power outages; and (2) because Cingular's commitment to place at least four hours of back-up power at new cell sites means Cingular will be using federal high-cost support in a manner consistent with law and the Commission's expectations.

If Cingular is not granted an exemption, it will have to expend a substantial amount to increase battery power at its cell sites that do not have four hours of battery power. Only 20 percent of Cingular's cell sites have four hours of battery power, while 30 percent have 3.75 hours of battery power, and the remaining 50 percent have between two and 3.75 hours of battery power. The cost to increase battery power to four hours at all cell sites would be very substantial even in relation to Cingular's expected \$36 million in federal support for 2007.

Cingular uses a combination of battery power and fixed and towed generators to maintain power at a cell sites during power outages. In essence, Cingular proposes that the commission grant it an exemption from WAC 480-123-070(6) so that it can operate existing cell sites as it operated prior to adoption of the requirement for four hours of battery power.

Cingular provided information about network problems and outages. That information suggests that cell site outages caused by power outages are rare. For the period January through September 2006, Cingular reports that less than one percent of its network problems resulted from power outages.

- 1 Prior to adoption of the rule, ETCs were treated in a competitively neutral manner because there was no requirement for ETCs to have back-up power at any level. Under the new rule, all wireless ETCs are required to meet the battery power requirement. If Cingular is granted the exemption it requests, there will not be competitive neutrality as to battery power, but there will be as to back-up power.

Cingular states it intends to place four hours of back-up power at all new cell sites and that it intends to increase back-up power at Priority 1 and -98 db cell sites that have less than 3.75 hours of battery power. Commission staff recommends the commission grant a temporary exemption to Cingular, subject to conditions.

C. Detailed Analysis

1. Cingular's compliance with the purpose of the rule through means other than four hours of battery power

In its request, Cingular states that it has a large number of cell sites in areas for which it is an eligible telecommunications carrier (ETC). Cingular states that when there is a commercial power outage, it maintains power at cell sites using power produced by batteries in combination with fixed and mobile generators. The level of available battery power varies:

- 20% of Cingular's cell sites have four or more hours of battery power
- 30% of Cingular's cell sites have at least 3.75 hours of battery power
- 50% of Cingular's cell sites have less than 3.75 hours of battery power⁴

Except for all conditions but extreme, major power outages, all of Cingular's cell sites have battery power sufficient to maintain the cell site until a fixed, automatic-start generator provides power within minutes of an outage, or until a technician arrives with a towed, 25-Kw generator. Cingular uses the combination of battery power and fixed and mobile generators whether the outage is routine or is part of a major outage.

Fixed generators generally have at least 24 hours of fuel, and some have fuel sufficient to operate for as long as 72 hours. Cingular's mobile generators are fueled to produce power for 24 hours. For an isolated outage, the mobile generator is left at the cell site by the technicians and operates until commercial power is restored. Cingular has a contract for refueling services and would direct the vendor to refuel any mobile generator that may need to operate in excess of 24 hours.

When there is a major power outage affecting many cell sites, Cingular cannot leave a towed generator at each cell site because it has a limited number of towed generators. Instead, to maintain power for cell sites without fixed generators, Cingular technicians tow mobile generators from cell site to cell site and at each cell site the generator is operated for approximately one hour to recharge the cell-site batteries.

As a result of its practices, in the first nine months of 2006, Cingular experienced only one outage affecting service in a portion of its network caused, in part, by a commercial power failure. That one instance, related to a wind storm that affected in excess of

⁴ The duration of battery power is not fixed; the period of battery operation declines as radios and other equipment are added to sites.

200,000 homes,⁵ represents less than 1 percent of the significant network problems that generated network trouble tickets⁶ in the period January through September 2006. Cingular determined that the extreme, major power outage in February 2006 affected about 10 percent of all its network cell sites, and that 13 percent of the affected cell sites (or 1.3 percent of all its network sites) were unavailable for a longer period of time than other cell sites because those 13 percent were equipped with two hours of battery power rather than four hours. The longest any cell site was not operating as a result of a power outage was 28 hours. Because cell sites provide overlapping coverage, and because Cingular did not anticipate answering questions about the effect of two hours of battery power rather than four, Cingular could not reach a conclusion about the impact on customer service caused by Cingular's use of some cell site with two hours of battery power.

The nearly unprecedented power outages caused by the December 13 windstorm affected more than 1 million homes, many for two to four days. Cingular was unable to maintain back-up power at many cell sites equipped with four hours of battery power, let alone maintain power at cell sites with two hours of battery power.

Commission staff visited cell sites to observe Cingular's ability to maintain power at cell sites that use of battery power and fixed and mobile generators. Commission staff visited two cell sites in Thurston County, one cell site in King County, and visited Cingular's Regional Network Operations Center (RNOC) in Redmond.

The cell sites visited by commission staff represented different power arrangements that exist throughout Cingular's network. One cell site visited is a large, -98 db cell site with batteries and a generator with fuel sufficient to run for 72 hours. A second cell site had battery power and a fixed generator with enough fuel to operate for 24 hours. At this cell site there is also a connection for a towed generator. Cingular demonstrated the process for hooking up a towed generator; it takes between five and ten minutes.

The third cell site visited has less than four hours of battery power. The antenna is on the roof of a restaurant and the cell cabinet sits at the back-end of the restaurant's parking lot. In a power outage, power would be maintained at this cell site with a towed generator. The cell site is an example of a cell site for which Cingular states that it would have to increase its leased space either to accommodate a hut that could hold more batteries or to provide space for fixed generation.

At the RNOC, Cingular employees maintain around the clock monitoring of Cingular's network. Employees receive an alarm when a cell site loses commercial power. The

⁵ On February 4, 2006, western Washington experienced a wind storm that included gusts as high as 78 mph. Power problems were extreme; Seattle, for example, had 28,000 homes without power (Seattle Times, 2/5/06). In addition to losing power to some cell sites in its network, Cingular also experienced difficulties that resulted from service problems with wireline providers that carry Cingular's traffic.

⁶ Cingular has filed as confidential a list of trouble tickets and the causes of the problems. Most problems are related to equipment malfunction.

standard response to an alarm indicating loss of power is to determine if back-up power is in use and then the RNOC staff waits to determine if the alarm was triggered by a very short duration power outage. If the power remains out for several minutes, RNOC staff then contacts the power provider for the cell site to determine the nature of the power outage. Based on the information received from the power company, Cingular determines how to respond and instructs regional field staff to take the appropriate action (e.g., dispatch a towed generator).

2. Cingular's commitment to place at least four hours of back-up power at new cell sites is sufficient to support granting the exemption

Cingular supports its argument by pointing to the commission's stated purpose for the ETC designation and certification rules. The commission stated that the "purpose of the rules is to permit the Washington Utilities and Transportation Commission (Commission) to determine if ETCs have used federal high-cost support in the manner prescribed by law."⁷ Cingular argues that the commission's purpose can be satisfied by applying the power requirements on a going-forward basis because cell sites built with federal high-cost funds from now on will use the funds to ensure reliability.

Cingular also makes the point that it was designated an ETC when there were no federal or state requirements placed on ETCs concerning power at cell sites and that the rule was not adopted based on particular experience in Washington in which Cingular or any other ETC had failed to serve customers in a reasonable manner.

3. Commission Staff's Analysis

- a. Service quality and power requirements prior to adoption of WAC 480-123-070(6) and competitive neutrality

The commission concluded in its first ETC order adopted in 1997 that the commission may examine the service quality of ETCs.⁸ To the extent the battery power requirement of WAC 480-123-070(6) is needed to ensure service quality, it is a valid rule based on the commission's prior order.

Prior to adoption of WAC 480-123, the commission treated each petitioner for ETC designation in a competitively neutral manner with respect to back-up power by not having a requirement. With respect to wireless carriers, which receive support based on customers served, the commission concluded that competition between wireless carriers

⁷ Docket No. UT-063066, *Order Granting Temporary Exemption*, ¶ 3.

⁸ "Requiring adequate service also is consistent with the pro-competitive policies of the 1996 Act. No company should be able to obtain a competitive advantage by avoiding its service quality responsibilities. The Commission expects that all companies receiving ETC status will comply with relevant Commission rules." See Docket Nos. UT-970333 through 970354, and 970356.

would affect their performance sufficient to provide an incentive for meeting customer service needs.⁹

In the process of drafting and adopting WAC 480-123-070(6), representatives of wireless ETCs stated that the industry standard for back-up power was four hours of battery back-up. After the initial draft rule was distributed, Cingular reported some of its cell sites have as little as two hours of battery power to be used in conjunction with power from a towed or fixed generator.

Adoption of the battery power requirement created a new competitively neutral standard that requires battery power for all wireless ETCs. Wireless carriers that invested previously in four or more hours of battery back-up power at cell sites were not affected by the new battery requirement. However, the rule requires Cingular to invest in batteries to the same extent as other wireless ETCs.

If Cingular is granted an exemption to operate with less than four hours of battery back-up power, then competitive neutrality, as defined by equal battery back-up power requirements, will not be the case. However, competitive neutrality defined as four hours of back-up power would be largely achieved over time as Cingular builds new cell sites.

b. Cingular's ability to maintain service when confronted with routine (non-major) power outages

Cingular has filed confidential information about the effect of power outages on its service for January through September 2006, along with information about all other service interruptions.¹⁰

Commission staff's analysis of that information shows that Cingular customers experienced no loss of service as a result of non-major power outages.

Cingular's report that customers did not lose service in the period January through September 2006 as a result of a routine power outage is consistent with what staff has learned about power outages and Cingular's network. Half of all Cingular cell sites have

⁹ Wireline companies seeking ETC designation were subject to WAC 480-120-411 before adoption of the new rule. Wireline carrier requirements for battery power under 480-120-411 are analogues to the battery power requirements for wireless carriers at hubs and switches, a standard met by Cingular and all other wireless ETCs. That is, the battery power requirements for wireline ETCs and wireless ETCs are essentially the same to the extent a wireline company needs battery power to ensure operations with respect to facilities such as switches.

¹⁰ Commission staff believes information for the period January through September 2006 rather than other historic information should be used for this analysis because that period reflects the experience of the combined Cingular and AT&T systems and does not suffer from the gaps in information that would be the case for older records. *See In the Matter of Request for Temporary Exemption*, Docket UT-063065. January through September 2006 also reflects the experience with commercial power as it is provided to Cingular today, that is, it reflects improvements in power distribution made by commercial power providers prior to 2006.

at least 3.75 hours of battery power. In comparison, the average power outage duration of all three investor-owned power companies is below 3.75 hours:

- Avista outages average 166 minutes
- PacificCorp outages average 100 minutes
- Puget Sound Energy (PSE) outages average 130 minutes

That is, on average, Cingular has enough battery power at 50 percent of its cell sites to remain operational in excess of the average outage time of all three investor-owned power companies.¹¹ At cell sites with less than 3.75 hours of battery power, there are either fixed generators that provide power during a routine power outage or Cingular dispatches a towed generator.

In addition, Cingular's network has many cell sites that provide overlapping service, and therefore losses of service from cell sites as a result of a power outage (or any more common reason) will not necessarily leave customers without telephone service.

c. Cingular's ability to maintain service during major power outages

The four-hour battery power requirement in the rule is not intended to ensure that ETC networks can function on battery power during major power outages. Extended operation on battery power would be very expensive. Cingular and other carriers supplement battery power with generated power to maintain service during major power outages. As the December 2006 storm demonstrated, even four hours of battery power is not sufficient to guarantee that cell sites will have power for the duration of a nearly unprecedented power outage.

At the same time, Cingular's experience in February 2006 demonstrates the availability of only two hours of battery power rather than four hours can result in prolonging some cell site outages. Because cell sites provide overlapping coverage, however, the effect of an outage on customers may not always be substantial. In addition, when subscribers cannot place a call at one location, the mobility of wireless service permits subscribers to go to a different location and complete a call.

d. The cost to Cingular to comply with the rule

Cingular has identified the cost components of altering cell site power capacity and provided "best," "worst," and "probable" case costs for each component.¹² The components (some of which are mutually exclusive) are:

¹¹ The outage information is from electric reliability reports filed by the electric companies. Avista, Docket No. UE-060623, 2005 Electric Service Reliability Monitoring Annual Report, p. 13, Chart 2.4 (Commission staff arrived at 166 minutes by averaging outage duration data for Avista's service areas in Washington); PacifiCorp, docket No. UE-061171, Washington Service Quality Review, FY 2006, p. 7; Puget Sound Energy, Docket No. UE-060500, Electric Service Reliability Report 2005 Annual Report, p. 11, Figure 1.

¹² The component costs are listed at the top of Cingular's confidential Exhibit C.

- Full battery replacement costs, including engineering
- Partial battery replacement costs, including engineering
- Lease costs
- Fixed generator addition costs
- Partial battery replacement to use with generator

Cingular's confidential Exhibit C shows the per-cell-site costs as well as total costs for the eight options (no exemption and seven partial exemptions) described in Table 1. Cingular's "Probable Case" estimate is composed of 50 percent of the best-case costs and 50 percent of the worst-case costs.

Cingular would need to alter 80 percent of its cell sites to provide four hours of battery power at each cell site. The total cost would be quite large even in relation to Cingular's anticipated federal universal service receipts for 2007 of approximately \$36 million.

In comparison, if Cingular were to increase power to four hours at Priority 1 and -98db cell sites with less than 3.75 hours of battery power, using a combination of batteries and fixed generation, the cost would be about one-sixth of the cost to increase battery power to four hours to its 80 percent of cell sites that do not meet the standard in the rule.

Conclusion

Commission staff's concludes is that non-major commercial power outages have not caused Cingular's customers to lose service in the period January through September 2006 because the amount of battery power combined with fixed and towed generating power is sufficient to provide power at cell sites for the duration of non-major power outages.

Commission staff also concludes that even in extreme circumstances, such as after the February 2006 storm, Cingular's use of cell sites with only two hours of battery back-up power could not have resulted in a substantial diminution of service such that the benefit of expending federal support to increasing battery power from two to four hours would be greater than the benefit of using federal support to expand network coverage and capacity.

Commission staff does conclude, however, that Cingular's plans to build new cell sites with four hours of back-up power will provide a benefit to consumers at a reasonable price, and that Cingular's plan to increase back-up power at Priority 1 and -98 db cell sites will also provide a benefit at a reasonable price.

Accordingly, commission staff recommends Cingular be granted an exemption for five years to the battery power requirements of WAC 480-123-070(6) for all Cingular cell sites, subject to the conditions that: (1) Cingular place four hours of back-up power when building new cell sites; and that (2) within two years, Cingular increase to four hours the amount of back-up power at all Priority 1 and -98 db cell sites that now have less than 3.75 hours of battery power.

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Table 1

Options, Number of Cell Sites Affected, and Cost

Options

- 1: Increase battery power to four hours at all cell sites below four hours
- 2: Increase battery power at cell sites with less than 3.75 hours of battery power
- 3A: Increase battery power to four hours at Priority 1 and -98db cell sites only*
- 3B: Increase battery power to four hours at Priority 1 and -98db cell sites with less than 3.75 hours of battery power*
- 4: Increase power to four hours at all cell sites below four hours using a combination of batteries and fixed generators
- 5: Increase power at cell sites with less than 3.75 hours of battery power using a combination of batteries and fixed generators
- 6A: Increase power to four hours at Priority 1 and -98db cell sites only, using a combination of batteries and fixed generators*
- 6B: Increase power to four hours at Priority 1 and -98db cell sites with less than 3.75 hours of battery power, using a combination batteries and fixed generation*

Option No.	Cell Sites Affected as % of Total	"WORST CASE" Cost as % of Option 1 (highest-cost option) ¹³	"BEST CASE" Cost as % of Option 1 (highest-cost option) ¹⁴	"PROBABLE CASE" Cost as % of Option 1 (highest-cost option) ¹⁵
1	80% ¹⁶	100%	85%	93%
2	50%	60%	44%	52%
3-A	36%	44%	36%	40%
3-B	25%	31%	23%	27%
4	80%	78%	69%	73%
5	50%	38%	28%	33%
6-A	36%	33%	28%	31%
6-B	25%	20%	15%	17%

* Cingular describes these two types of sites in footnote three to its confidential Exhibit A. A cell site with -98 db coverage is generally considered to be a stationary outdoor coverage site. Internally, Cingular has labeled some cell sites "priority 1" and Cingular considers them a high priority to the network because they serve important locations such as regional hospitals and important government buildings.

¹³ Cost estimates taken from Cingular's Confidential Exhibit C.

¹⁴ Cost estimates taken from Cingular's Confidential Exhibit C.

¹⁵ Cost estimates taken from Cingular's Confidential Exhibit C.

¹⁶ 20 percent of Cingular's cell sites meet or exceed the requirement of four hours of battery back-up power.