



General Manager  
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TRANSMITTAL MEMORANDUM
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TO: The Honorable Mayor and City Council

FROM: Lacey G. Simpson, Acting General Manager

DATE: December 7, 2021

RE: **Reports of November 22 & 24, 2021 Power Outages**

Attached for City Council review are memoranda from Electric System Engineering Manager Jeremy Bynum regarding the power outages of November 22 & 24, 2021. Mr. Bynum will attend the City Council meeting of December 16, 2021, in order to address any questions and/or concerns that Councilmembers may have.



Electric Division  
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## TRANSMITTAL MEMORANDUM

**TO:** Lacey Simpson, Acting General Manager

**FROM:** Jeremy Bynum PE, Electric System Engineering Manager

**DATE:** December 6, 2021

**SUBJECT:** **Electrical Outage of November 22, 2021**

On Monday November 22, 2021, at 12:53 AM, an outage affected all electric services in Ketchikan. This outage resulted from a system fault and loss of generation from Southeast Alaska Power Agency (SEAPA) due to a 34.5kV phase-to-phase line fault and SEAPA transformer protective relay trip.

The outage was initially caused by wind-blown debris into the 34.5kV lines near Herring Cove; the line contact resulted in a 34.5kV phase-to-phase line fault. That fault then caused a differential relay (87T) trip of the SEAPA 115kV transformers. The 87T tripped the 115kV transmission from Swan Lake, disconnecting Ketchikan from the SEAPA system.

The sudden loss of generation, approximately 9.8 MW, and the fault at Mountain Point caused the power system to become unstable, resulting in a system-wide event. All KPU system feeders opened during the event causing a system-wide power outage and all generation was lost.

The system restoration process required additional time due to the multiple causes of the outage and the complications of restoring the whole system from a blackout condition. KPU operators, powerhouse mechanics, SCADA technicians, utility electricians, lineman, and other staff methodically evaluated these complex issues, identified the causes, made repairs, and began system power restoration. Diesel generation from Bailey Powerplant was required as part of the system restoration process. The power restoration process takes time because generation has to be restored in a controlled manner; feeders in the system are closed in a systematic process to restore system power.

All 7,647 KPU customers were affected by the outage. Although power was restored to all customers within three hours and twenty-three minutes (3:23), the total-system generating capacity was not restored until 3:22 PM or fourteen hours and twenty-nine minutes (14:29) from the start of the outage.

### Operation Schedule

Location	Open	Close	Duration (hr:min)	Customers
Point Higgins F1S	0:53	3:24	2:31	521
Point Higgins F2N	0:53	3:28	2:35	559

Operation Schedule continued:

Location	Open	Close	Duration (hr:min)	Customers
Ward Cove F 1 S	0:53	3:01	2:08	294
Ward Cove F 2 N	0:53	3:23	2:30	437
Gravina Tie	0:53	2:14	1:21	6
Bethe F1J	0:53	2:59	2:06	945
Bethe F4T	0:53	2:45	1:52	383
Be Sectionalizer	0:53	2:46	1:53	247
Port West F1N	0:53	2:41	1:48	937
Port West F2S	0:53	2:32	1:39	107
Port West F3	0:53	2:11	1:18	55
KTN F1	0:53	2:16	1:23	633
KTN F2	0:53	2:17	1:24	582
KTN F3	0:53	2:23	1:30	784
KTN F4	0:53	2:42	1:49	334
Mountain Point F1N	0:53	4:03	3:10	303
Mountain Point F2S	0:53	4:16	3:23	520
34.5kV Tie Breaker <sup>1</sup>	0:53	3:15	2:22	-

Cc: Andy Donato, Electric Division Manager  
Mark Adams, Electric Division Operations Manager  
Diane Bixby, Administrative Assistant

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<sup>1</sup> Located at Bailey Substation; reconnects KPU to SEAPA generation.



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## TRANSMITTAL MEMORANDUM

**TO:** Lacey Simpson, Acting General Manager

**FROM:** Jeremy Bynum PE, Electric System Engineering Manager

**DATE:** December 6, 2021

**SUBJECT:** **Electrical Outage of November 24, 2021**

On Wednesday November 24, 2021, at 9:06 AM, an outage affected electric services in Ketchikan caused by a loss of generation from Southeast Alaska Power Agency (SEAPA).

A SEAPA generator at Swan Lake tripped offline due to an operations issue while performing maintenance at the Swan Lake facility; this caused a loss of generation in the SEAPA system. The sudden loss of approximately 9.0 MW of generation caused system instability, resulting in load shedding in Ketchikan. Eight (8) KPU system feeders opened during the event causing power outages.

KPU and SEAPA operators quickly identified the issue and KPU immediately began power restoration. Initially 3,665 customers were affected by the outage. Within twenty-six minutes (0:26), power was restored to all customers.

### Operation Schedule

Location	Open	Close	Duration (hr:min)	Customers
Point Higgins F1S	9:06	9:30	0:24	521
Point Higgins F2N	9:06	9:32	0:26	559
Ward Cove F 1 S	9:06	9:19	0:13	294
Ward Cove F 2 N	9:06	9:23	0:17	437
Be Sectionalizer	9:06	9:15	0:09	247
KTN F3	9:06	9:16	0:10	784
MTP F1 N	9:06	9:26	0:20	303
MTP F2 S	9:06	9:29	0:23	520

Cc: Andy Donato, Electric Division Manager  
Mark Adams, Electric Division Operations Manager  
Diane Bixby, Administrative Assistant