TOGETHER WE DELIVER

Odessa North Congestion Update

Sept 13 & 14, 2012
Presentation to Reliability Operations Subcommittee and ERCOT Regional Planning Group
Austin, TX

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Distribution and Transmission

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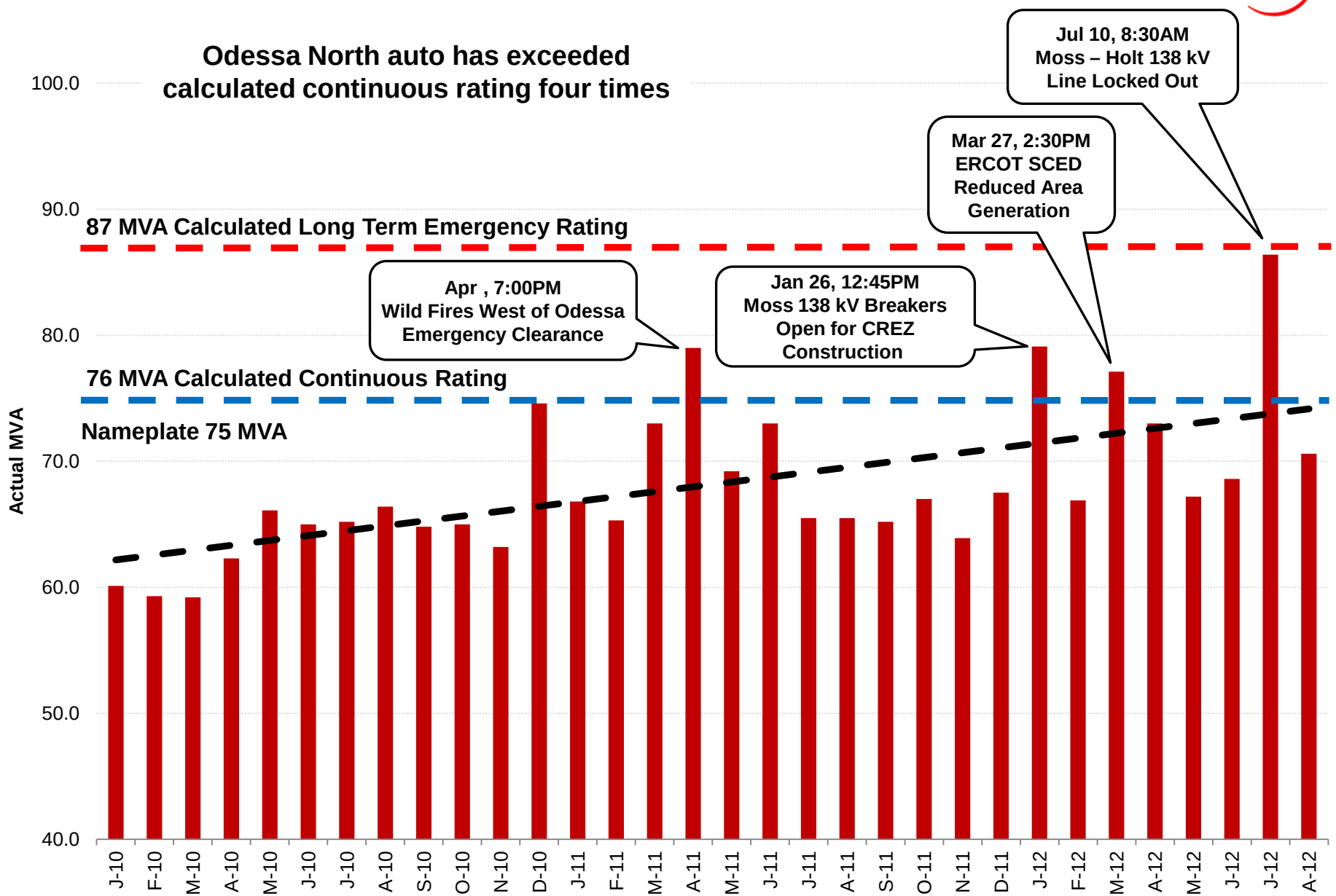
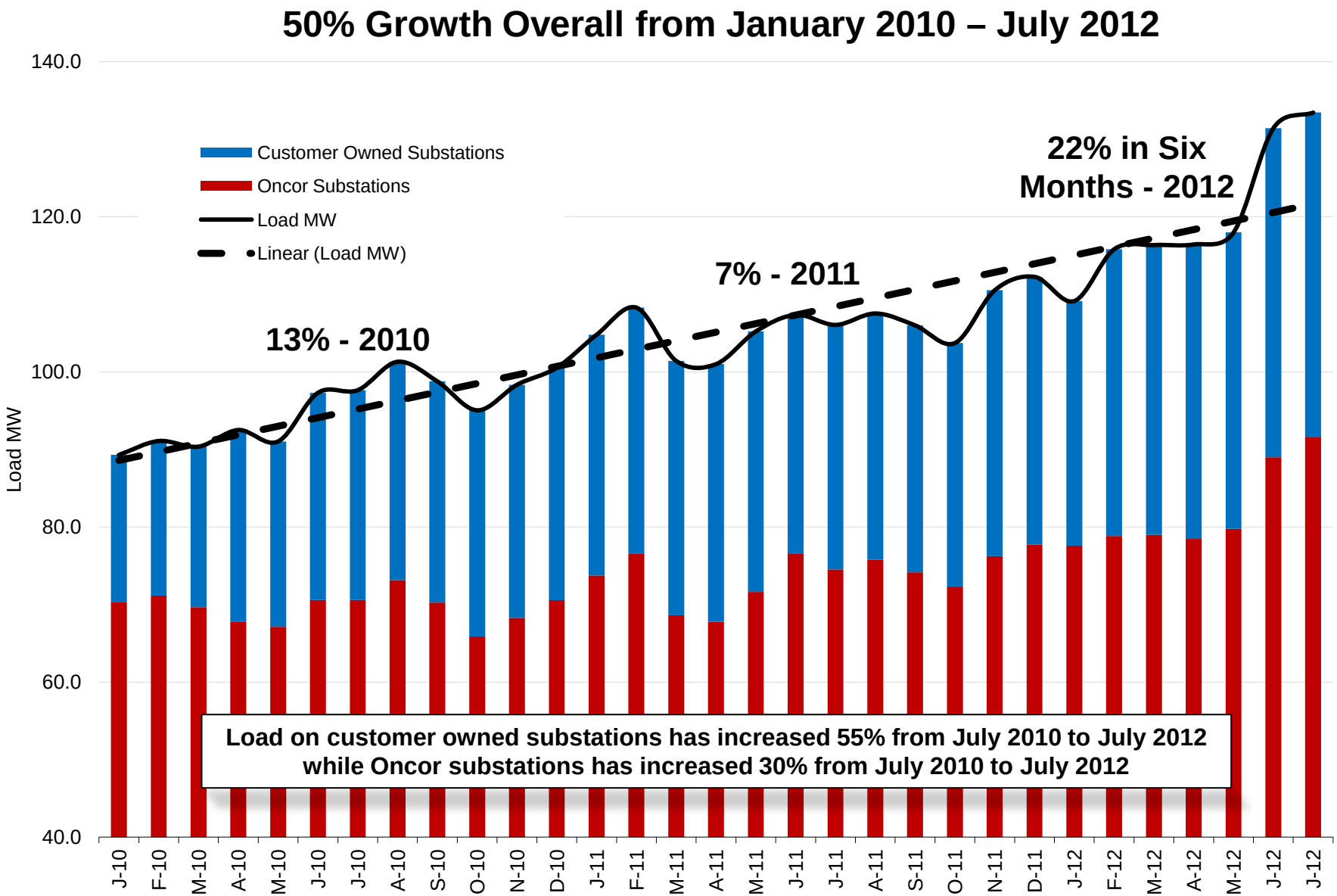
Odessa North Auto Actual Experience



Odessa North Area 69 kV Peak Load Growth



Odessa North Area 69 kV Substations

Bus	Substation	Jul-10 Actual MW	Jul-11 Actual MW	Jul-12 Actual MW	%Incr
1253	Midway	13.3	15.4	17.3	30.1%
1259	North Cowden	12.3	13.7	16.2	31.7%
1280	Bakke	9.2	10.5	12.5	35.9%
1266	Midland Farms	5.0	4.9	11.9	138.0%
1270	Frankel City	10.0	8.6	10.3	3.0%
1285	Means	8.1	8.2	8.3	2.5%
1274	Fullerton	3.6	3.9	4.9	36.1%
1263	Emma	4.3	3.9	3.8	-11.6%
1252	Vest	2.4	3.0	3.0	25.0%
1265	San Andres	2.1	2.1	2.1	0.0%
1255	Odessa Basin	0.0	0.0	1.0	+∞
1273	Phillips Andrews	0.2	0.1	0.2	0.0%
11257	Ector Shell	0.0	0.0	0.0	0.0%
	Oncor Substations Subtotal	**70.5**	**74.5**	**91.5**	**29.8%**
9999/11255	CO1	--	--	26.8	+∞
1260	CO2	22.3	25.1	9.5	-57.4%
1258	CO3	4.8	6.4	5.6	16.7%
	Customer Owned Substations	**27.1**	**31.5**	**41.9**	**54.6%**
	Total Oncor Served	**97.6**	**106.1**	**133.4**	**36.7%**

Interim Actions (Short Term) Underway

Several actions are underway to mitigate the issues until longer term projects can be placed in service;

MITIGATION PLAN (MP) APPROVED BY ERCOT ON JULY 18

Post-contingency, open the 138 kV feed from Moss to Odessa North and open the 69 kV line from Odessa Basin to Wink

ERCOT PCAP

Opens the Odessa to Odessa N and the Moss to Odessa SW 138 kV line sections pre-contingency, replaces the existing MP

ODESSA NORTH 138/69 KV AUTOTRANSFORMER

Installed online monitoring of top-oil and winding temperatures

- Readings may indicate an increase to the autotransformer rating
- Readings available to transmission control room supporting operating actions

Installed auxiliary cooling equipment and additional fans

Exploring replacement with higher rated autotransformer

Exploring installing additional autotransformer at another location

With increase in autotransformer capability 69 kV line(s) becomes new limit

Clearances and coordination challenging

Interim Actions (Short Term) Underway

Continued;

INVESTIGATING / INSPECTING OPERATING 138 AND 69 kV LINES AT ELEVATED TEMPERATURES

Increasing clearances, reducing sag, adding poles/structures, possible replacement of wire and insulators, etc...

REVIEWING EQUIPMENT LIMITS FOR UPCOMING LOADING REQUIREMENTS

Relay settings, wave traps, switches, current transformers, breakers, etc...

DISTRIBUTION OPTIONS

Load transfers between stations off of congested lines
Fast install of new substations (mobile or regular)
Install additional capacitor banks to improve power factor and voltage

ENHANCED CUSTOMER COMMUNICATIONS

More updates on future plans load estimates/projections
Developing nontraditional load forecasting methods
Improve customer power factor to increase efficiency and voltage

Planned Projects (Longer Term) Underway

TROUBLES IDENTIFIED ON BOTH 69 kV AND 138 kV SYSTEMS USING FULL CONTINGENCY SET AND VARIOUS GENERATION LEVELS

EXISTING PROJECTS IN PLAN ACCELERATION (RPG Update soon):

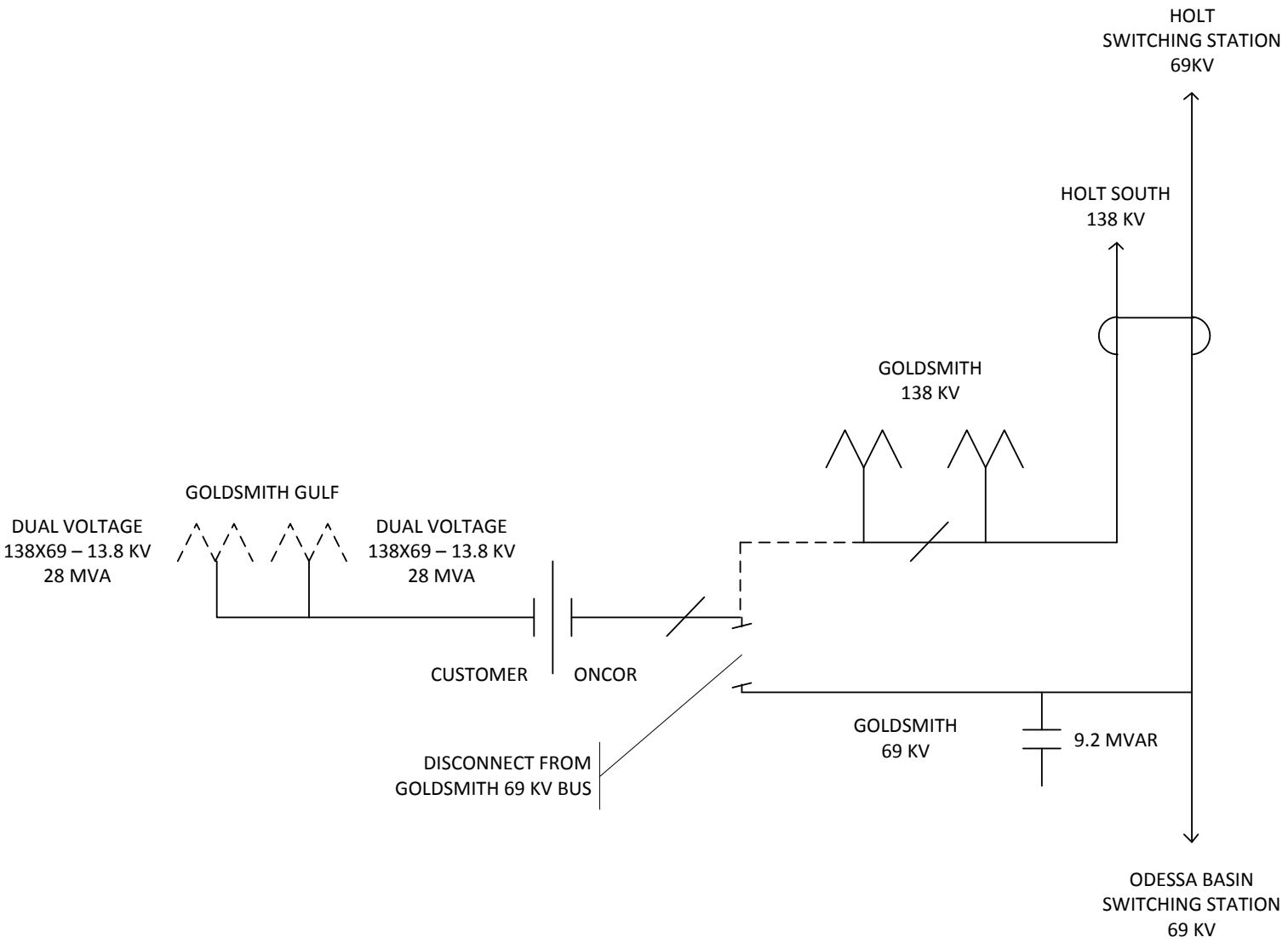
- **Convert load from 69 kV to 138 kV**
  - **Holt–Goldsmith South POI 138 kV Line - Dec 2012**
  - **Holt–Goldsmith South POI–Odessa North 138 kV Line - May 2013**
    - Creates new 138 kV circuit Odessa North to Holt
- **Upgrade Moss–Holt 138 kV Line**
- **Upgrade Odessa–Odessa North 138 kV Line**
- **Upgrade Moss–Odessa EHV 138 kV Line**
- **Upgrade Moss–Westover 138 kV Line**

NEW PLAN PROJECTS (RPG submission soon):

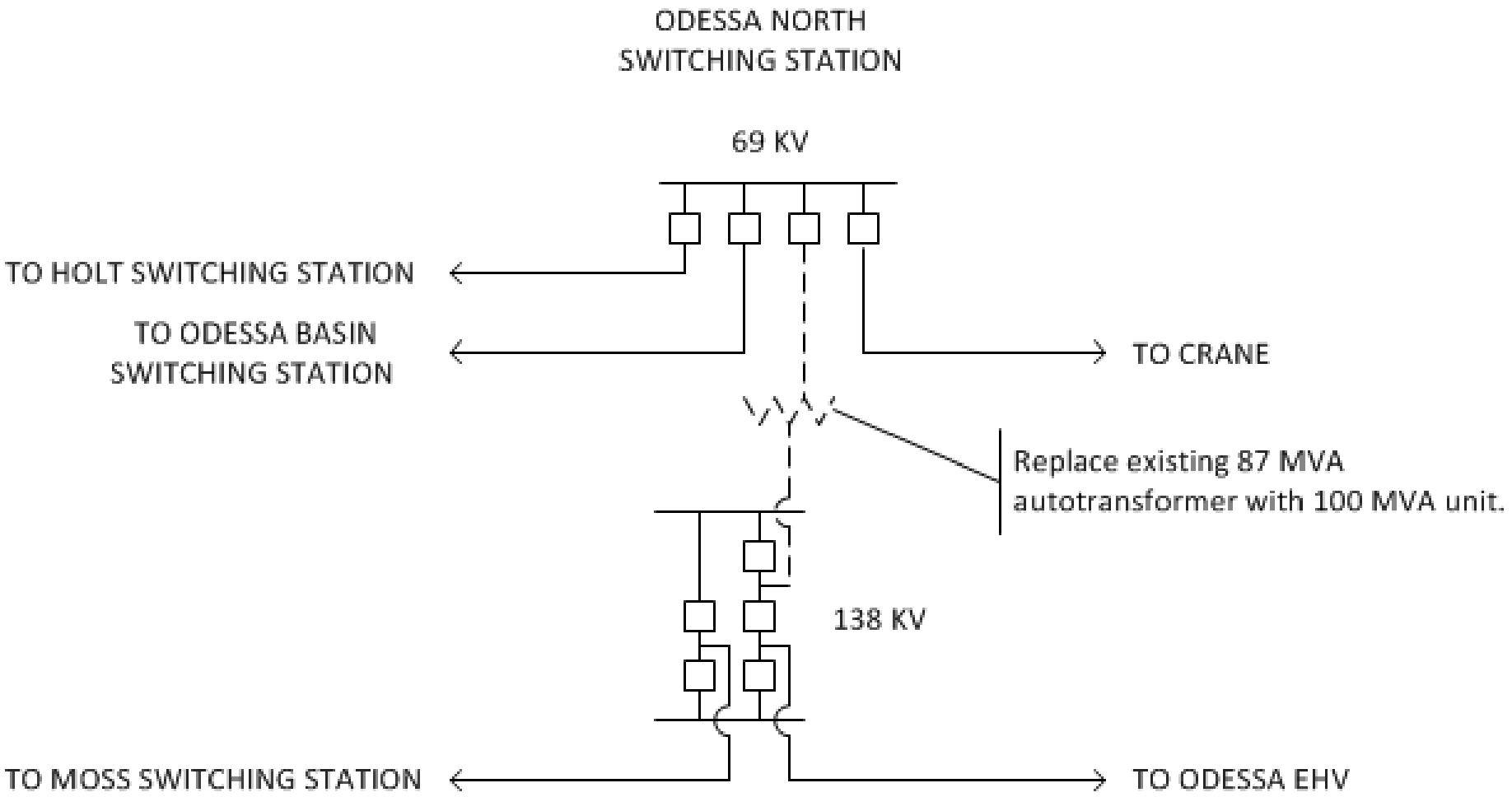
- **Permian Basin to Culberson 138 kV Line – CCN Required**
- **Moss to Permian Basin Double Circuit 345 kV Line – CCN Required**
- **Permian Basin Establish 345 kV Station**
- **Permian Basin Install 600 MVA 345/138 kV Autotransformer**

Questions / Discussion

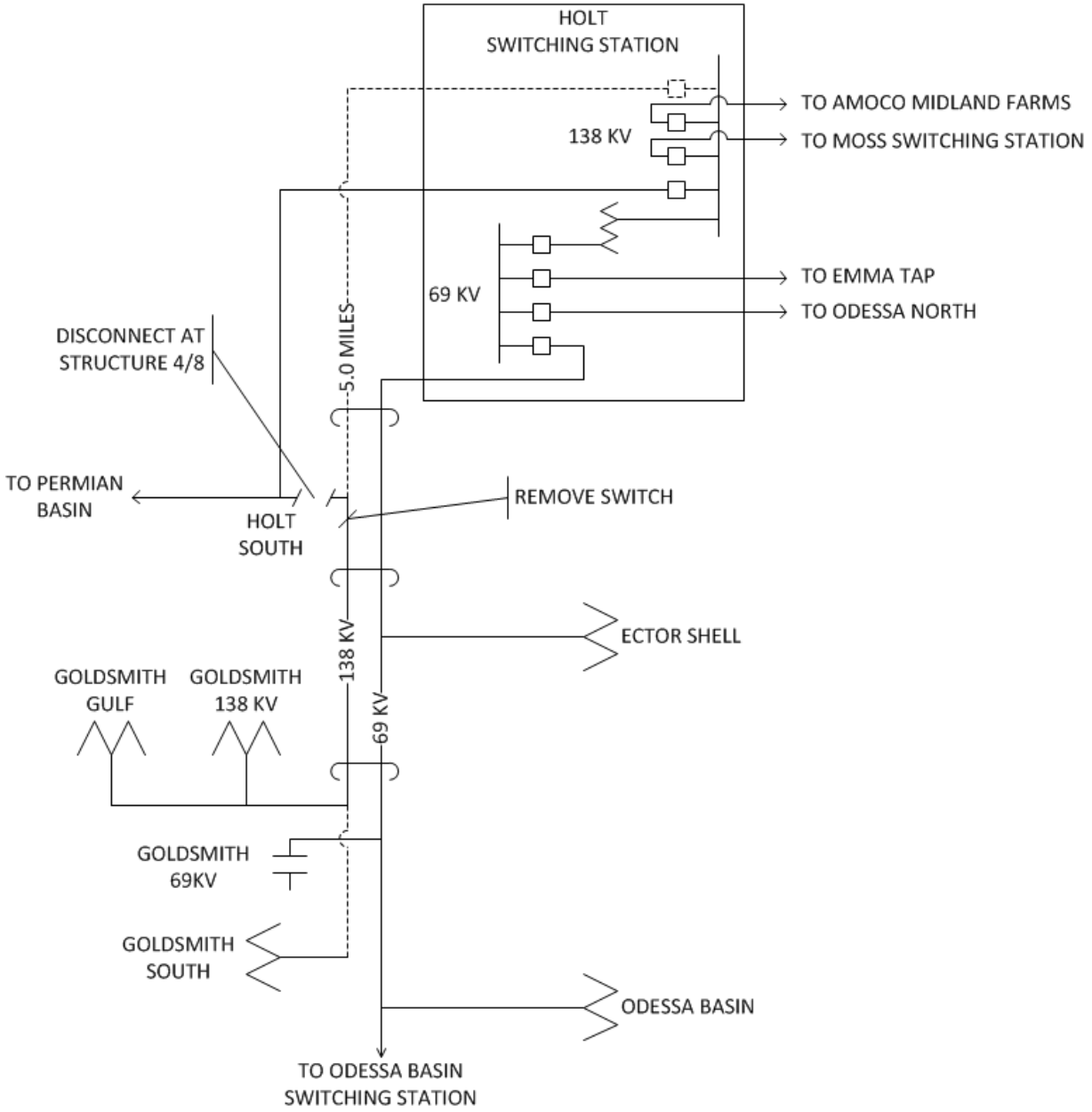
Goldsmith Gulf 138 kV POI



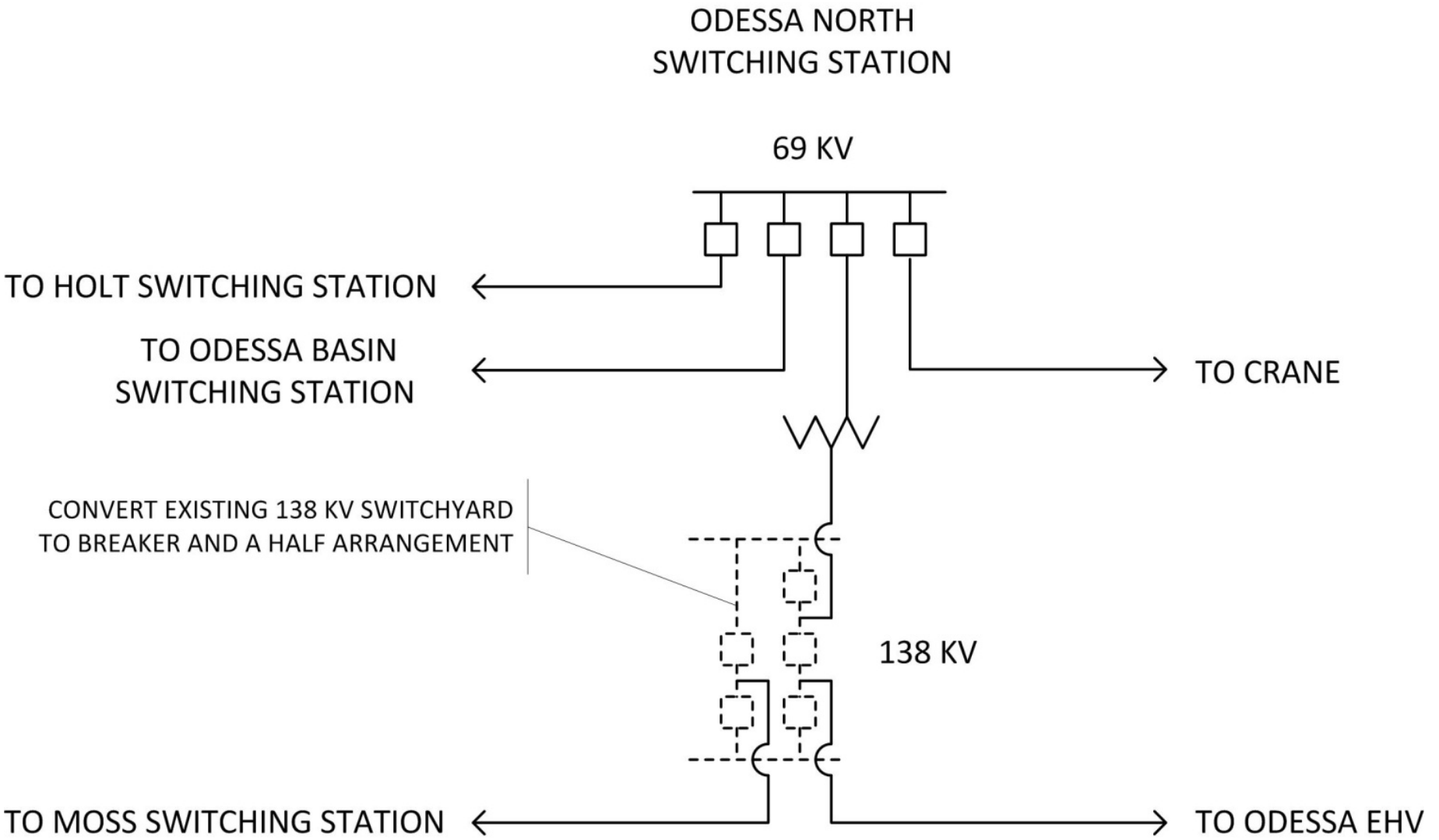
Odessa North 138/69 kV Autotransformer Upgrade



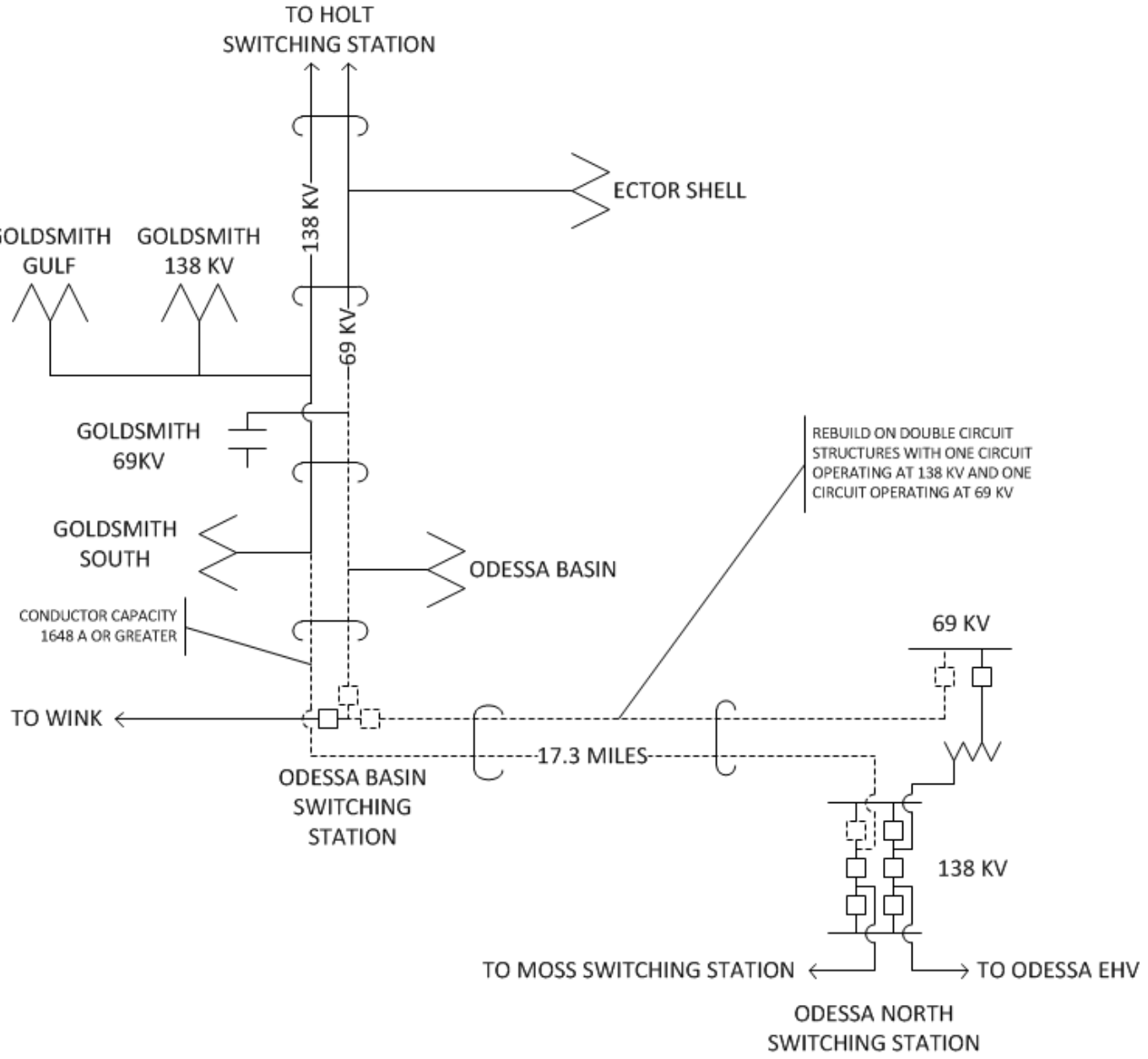
Holt – Goldsmith South 138 kV Line



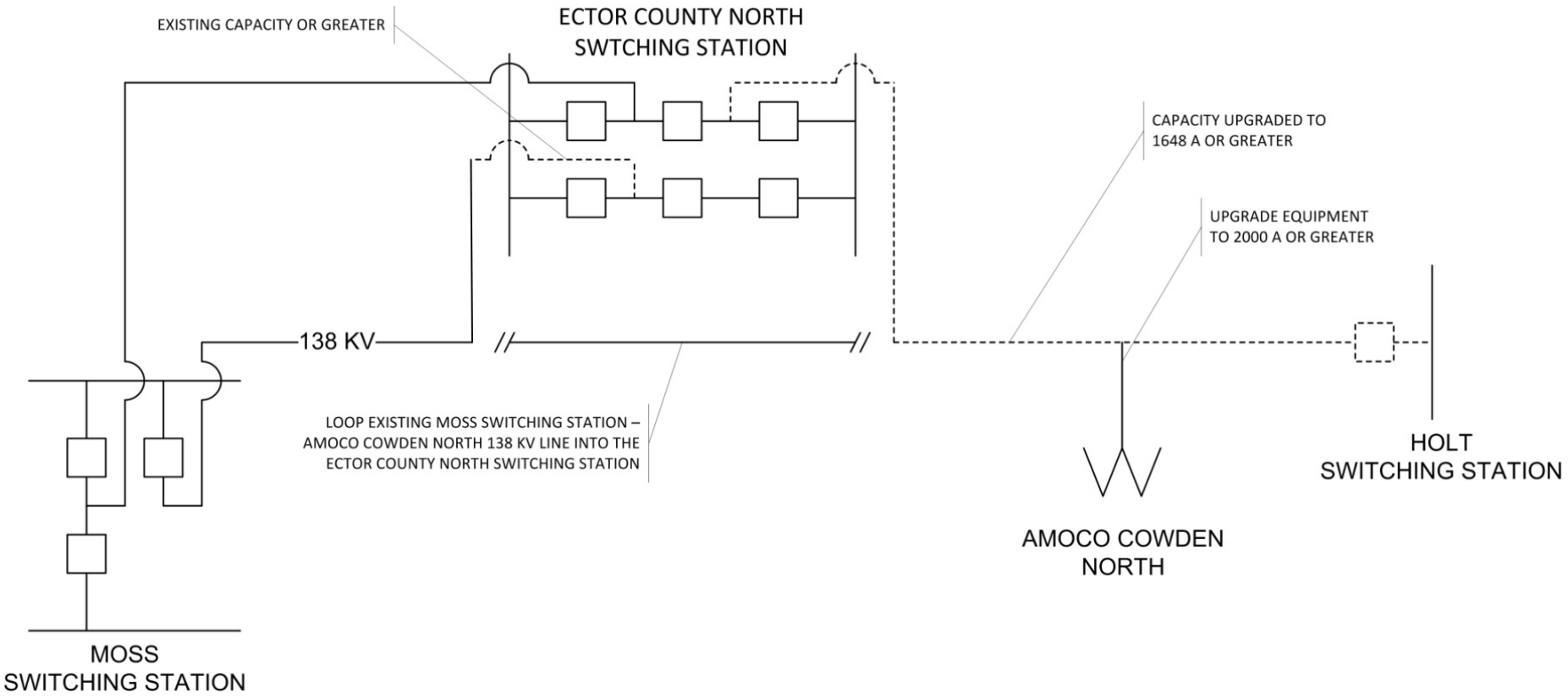
Odessa North 138 kV Switching Station



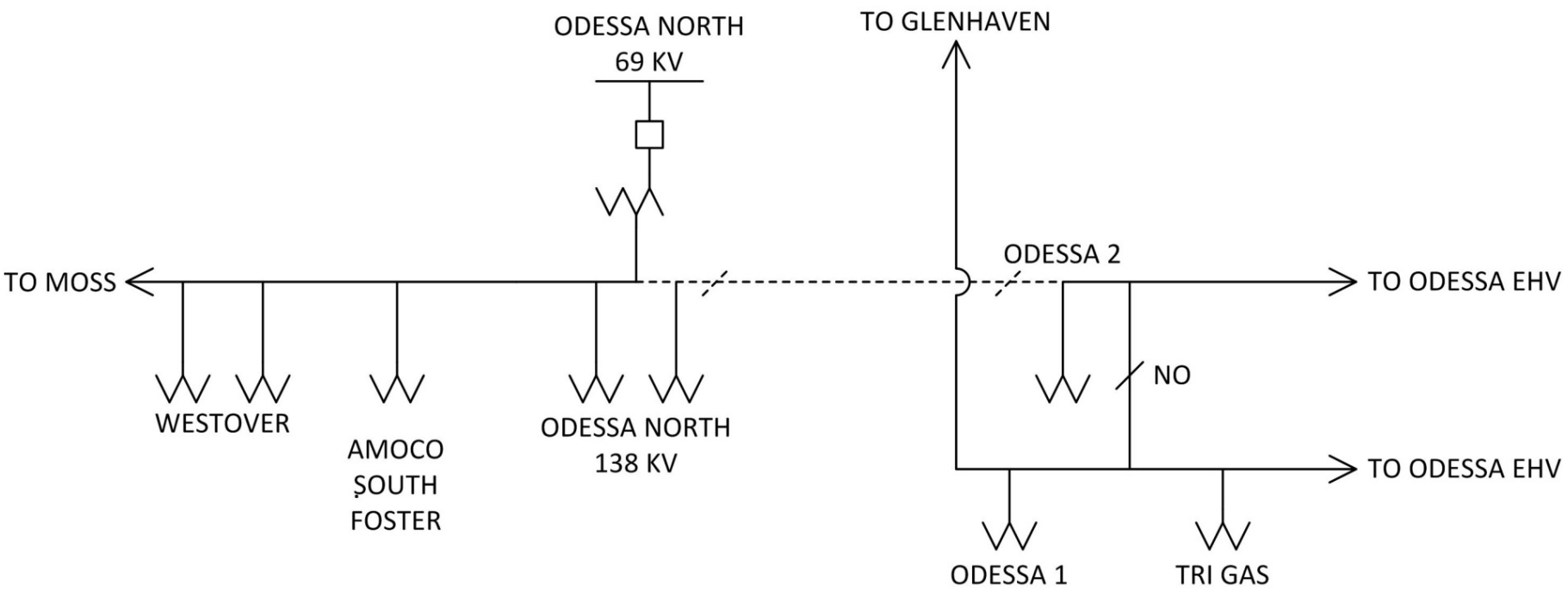
Odessa North – Goldsmith South 138 kV Line



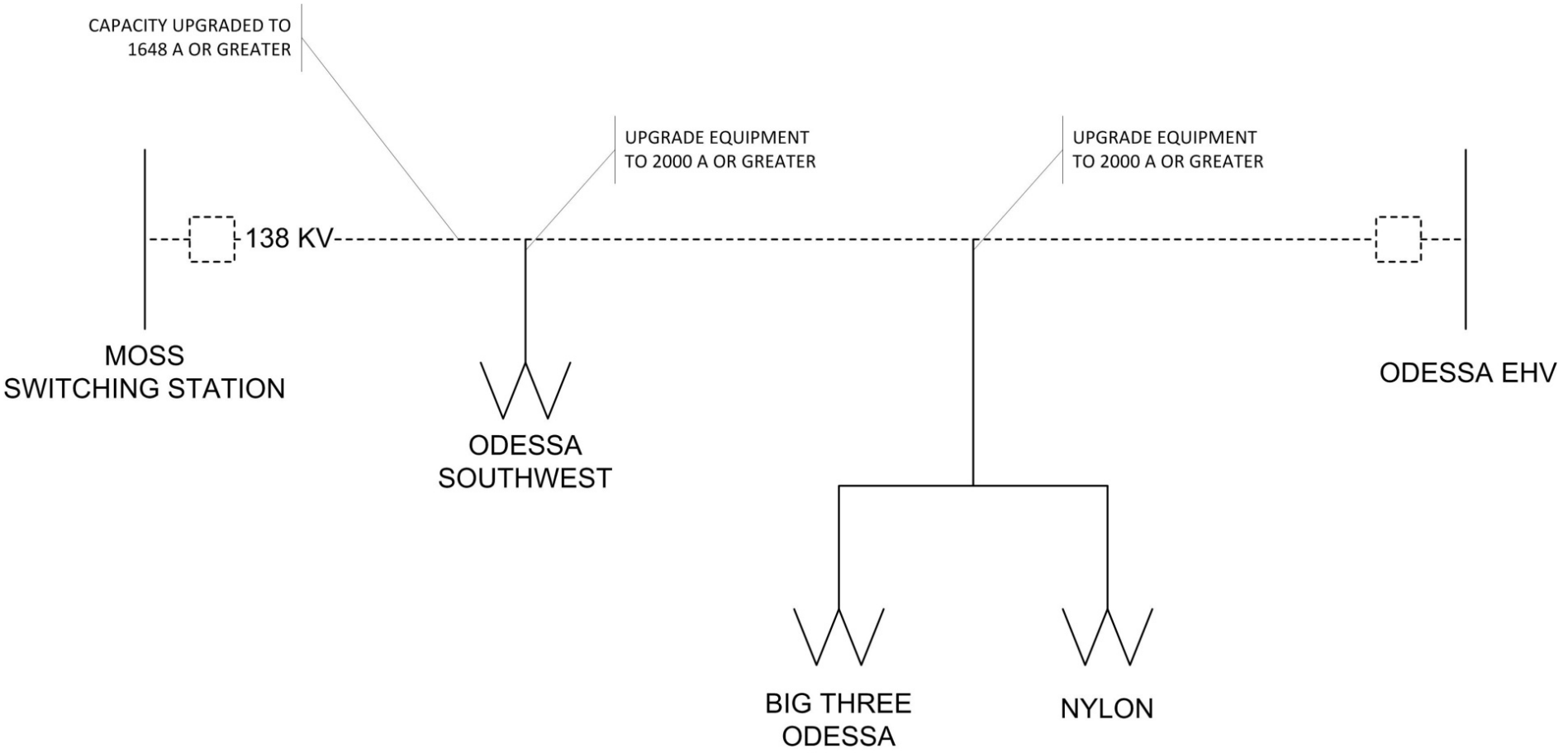
Moss – Holt 138 kV Line



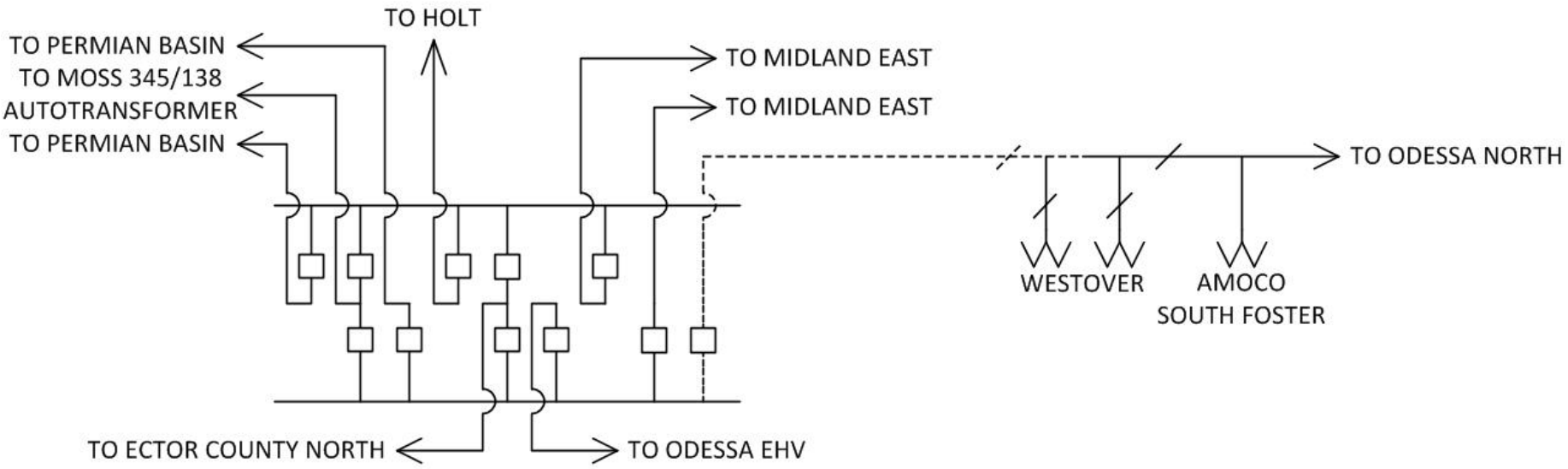
Odessa – Odessa North Switch 138 kV Line



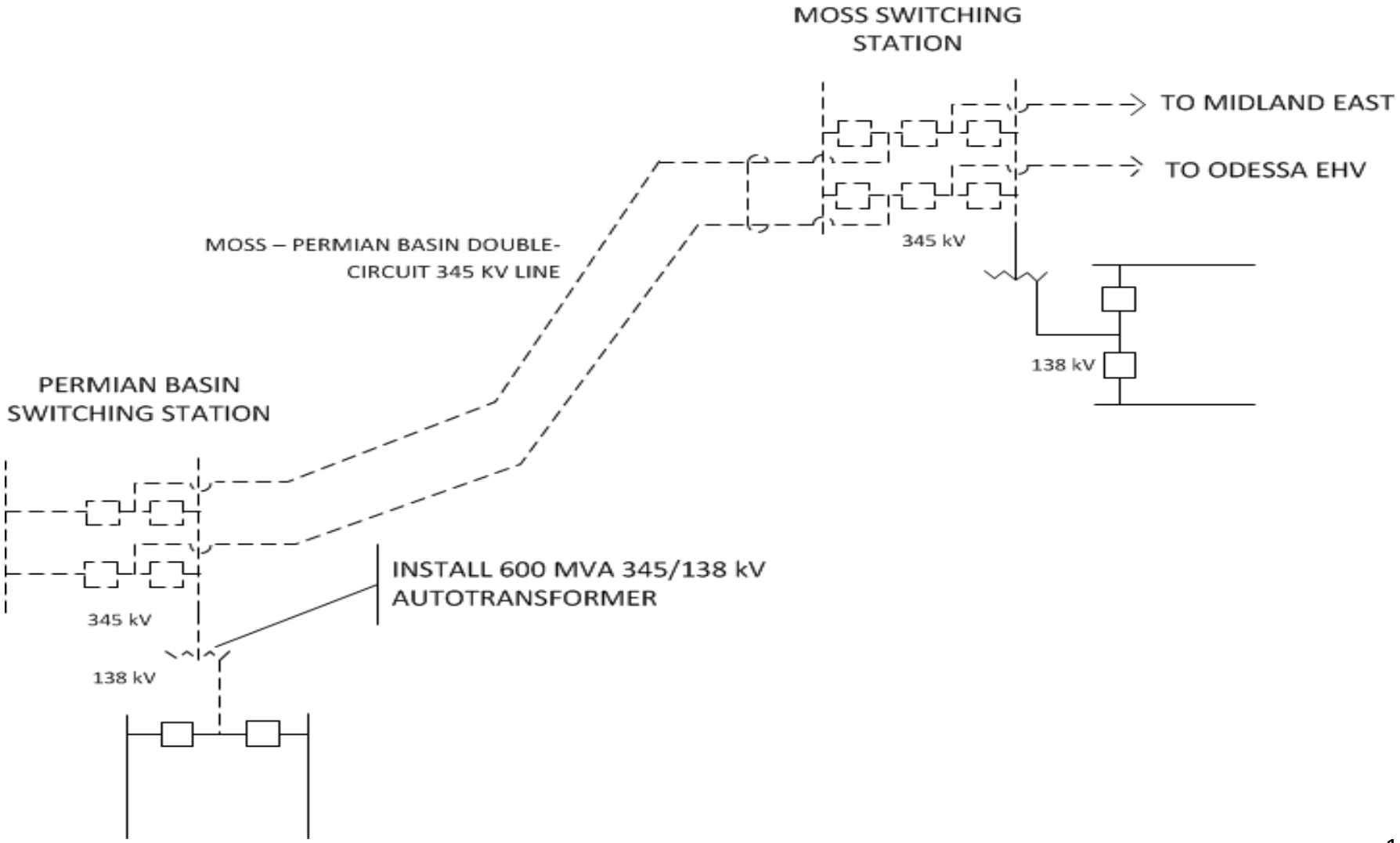
Odessa EHV – Big 3 Tap – Odessa Southwest – Moss 138 kV Line



Moss - Westover 138 kV Line



Moss 345 kV Switching Station
Permian Basin 345/138 kV
Autotransformer and 345 kV Switchyard
Moss – Permian Basin Double-Circuit 345 kV Line



Permian – Culberson 138 kV Line