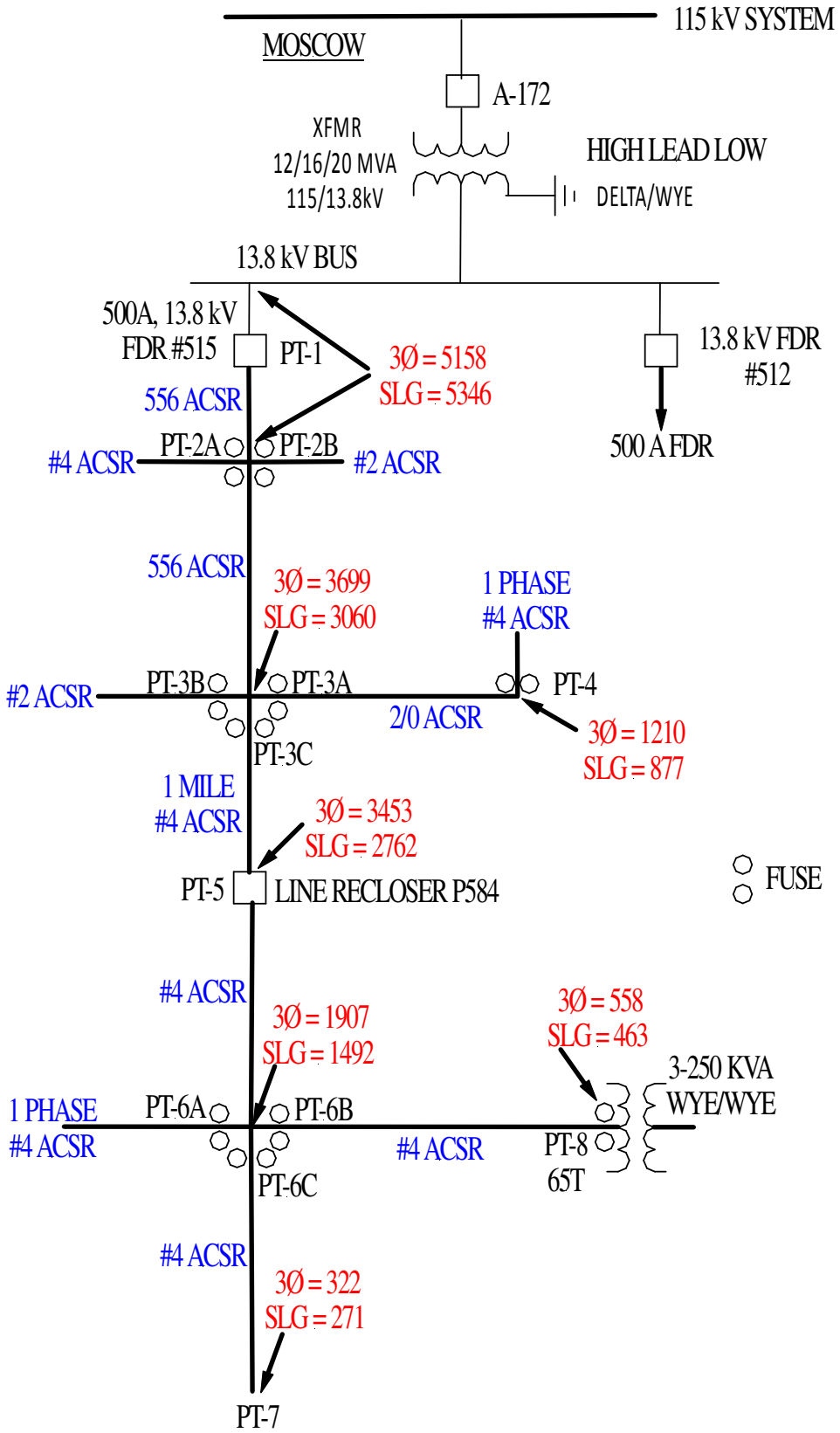

Point 1 – Feeder Breaker

51P PU =

51G PU =

Coordinates with:

Conductor protected:

Point 3C

Fuse Size =

Coordinates with:

Conductor protected:

Point 5 – Midline Recloser

51P PU =

51G PU =

Coordinates with:

Conductor protected:

Point 6B

Fuse Size =

Coordinates with: 65T

Conductor protected: #4 ACSR

Table 1. Shows the maximum fault current for which S&C type T fuses can still be protected by a recloser/breaker instantaneous trip for temporary faults (minimum melt curve at 0.1 seconds):

6T – 120 amps
8T – 160 amps
10T – 225 amps
12T – 300 amps
15T – 390 amps
20T – 500 amps
25T – 640 amps
30T – 800 amps
40T – 1040 amps
50T – 1300 amps
65T – 1650 amps
80T – 2050 amps
100T – 2650 amps
140T – 3500 amps
200T – 5500 amps

Table 3. Typical continuous and 8 hour emergency rating of the S&C T rated silver fuse links plus the 140T and 200T.

Fuse Rating	Continuous	8 Hour emergency
6T	7.8	8.8
8T	10	12
10T	13	15
12T	16	18
15T	22	25
20T	27	31
25T	36	41
30T	42	49
40T	52	59
50T	63	72
65T	88	100
80T	105	115
100T	120	135
140T	210	225
200T	295	320

Table 4. Conductor current ratings for various sizes of ACSR conductor at 25°C ambient taken from the Westinghouse Transmission & Distribution book.

Conductor	Rating
556	730
336.4	530
4/0	340
2/0	270
1/0	230
#2	180
#4	140

Table 5. Conductor current ratings for various sizes of copper conductor at 25°C ambient taken from the Westinghouse Transmission & Distribution book.

Conductor	Rating
2/0	360
1/0	310
#2	230
#4	170
#6	120

Table 6. Typical Coordinating Time Intervals (CTI) that Avista generally uses between protective devices. Other utilities may use different times.

DEVICES:	**CTI (Seconds)**
Relay – Fuse Total Clear	0.2
Relay – Series Trip Recloser	0.4
Relay – Relayed line Recloser	0.3
Low Side Xfmr Relay – Feeder Relay	0.4
High Side Xfmr Relay – Feeder Relay	0.4
Xfmr Fuse Min Melt – Feeder Relay	0.4

Table 7. Typical minimum conductor that can be protected by the Avista feeder settings and S&C type T fuses. These are what Avista uses. Other companies may use different values. The relay phase pickup for a given feeder rating is typically about twice the feeder rating and we use Extremely Inverse curves.

Feeder Setting or Fuse	MIN Conductor Size
500 AMP fdr Setting	#2CU or 1/0 ACSR
300 AMP fdr setting	#4CU or #2ACSR
200T	#2CU
140T	#4CU or #2ACSR
100T	#6CU or #4ACSR
65T	#8CU

Table 2. Shows the maximum fault current for which S&C type T fuses can coordinate with one another. NOTE: These values were taken from the S&C data bulletin 350-170 of March 28, 1988 based on **no preloading and then preloading** of the source side fuse link. Preloading is defined as the source side fuse carrying load amps equal to it's rating prior to the fault. This means there was prior heating of that fuse so it doesn't take as long to blow for a given fault.

Source Side Fuse	Load Side Fuse	Maximum Coordinating Current No preload	Maximum Coordinating Current with preload
200T	140T	8,300	4,650
140T	100T	5,800	3,800
100T	80T	3,600	1,900
80T	65T	2,700	1,400
65T	50T	2,200	Too close
50T	40T	1,550	640
40T	30T	1,400	820
30T	25T	1,100	570
25T	20T	840	360
20T	15T	630	315
15T	12T	540	295
12T	10T	410	210
10T	8T	320	175
8T	6T	235	145