E.W. Howell Co., LLC
113 Crossways Park Drive
Woodbury, NY 11797
Phone: 516-921-7100
Fax: 516-921-7920

REQUEST FOR INFORMATION
No. 00050

TITLE: Main Feed Outdoor Substation

DATE: 3/19/2010

PROJECT: BNL CCWF-II

JOB:

TO: Attn: Alan Raphael
Brookhaven National Laboratory
Brookhaven Sciences Associates, LLC
Project Modernization Office
Upton, NY 11973-5000
Phone: 631-344-5854

STARTED:

COMPLETED:

REQUIRED: 3/26/2010

WORK IMPACT: Unknown

SCHEDULE IMPACT: Unknown

COST IMPACT: Unknown

QUESTION:

3/19/2010
Main Feed Outdoor Substation

Please clarify the rating off the main electrical service that feeds the existing outside substation and transformers

CC: Bill Harrison, George Santorilla, File

PROPOSED SOLUTION:

ANSWER:

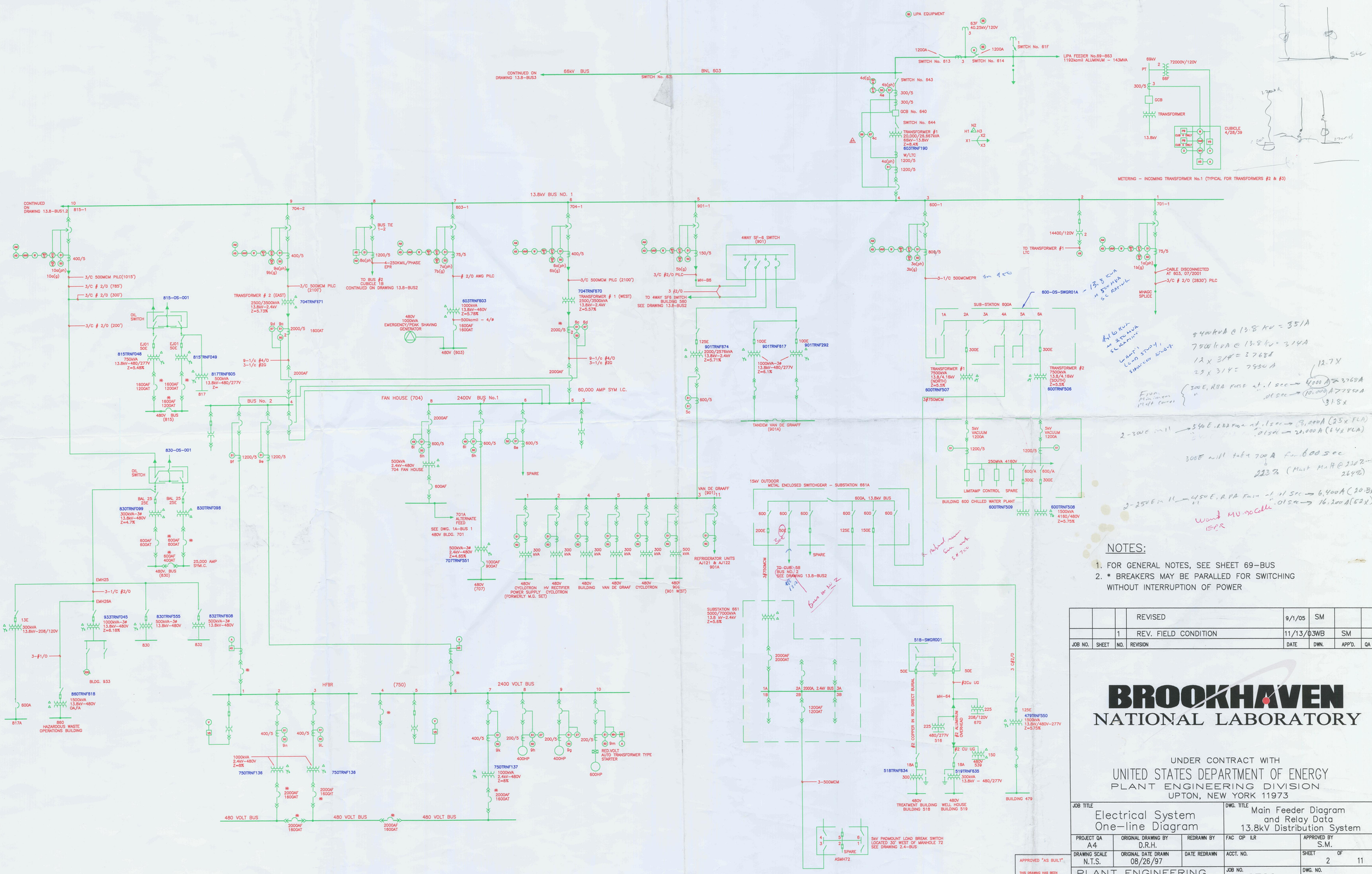
PLEASE SEE ATTACHED DRAWING 13.8-BUS1.1, ELECTRICAL SYSTEM ONE-LINE DIAGRAM, MAIN FEEDER DIAGRAM AND RELAY DATA 13.8kV DISTRIBUTION SYSTEM.

W. HARRISON 3-24-10

Requested By: E.W. Howell Co., LLC

Date: _____

Signed: _____
Hans Laros


LIPA EQUIPMENT
40.25kV/120V
SWITCH No. 61F
LIPA FEEDER No.69-883
1192kcmil ALUMINUM - 143MVA
SWITCH No. 613
SWITCH No. 614
1200A
CONTINUED ON DRAWING 13.8-BUS3
66kV BUS
SWITCH No. 63
BNL 603
SWITCH No. 843
GCB No. 640
SWITCH No. 644
TRANSFORMER #1
20,000/28,667kVA
66kV-13.8kV
Z=8.4%
603TRNF190
W/LTC
1200/5
69kV
72000V/120V
PT
66F
300/5
GCB
TRANSFORMER
13.8kV
CUBICLE 4/28/39
METERING - INCOMING TRANSFORMER No.1 (TYPICAL FOR TRANSFORMERS #2 & #3)
13.8kV BUS NO. 1
CONTINUED ON DRAWING 13.8-BUS1.2
815-1
704-2
603-1
704-1
901-1
600-1
701-1
400/5
3/C 500MCM PILC(1015')
3/C # 2/0 (785')
3/C # 2/0 (300')
3/C # 2/0 (200')
815-OS-001
OIL SWITCH
815TRNFD048
750kVA
13.8kV-480/277V
Z=5.48%
815TRNFD049
817TRNF805
500kVA
13.8kV-480/277V
Z=
1600AF
1200AT
480V BUS (815)
TRANSFORMER # 2 (EAST)
2500/3500kVA
13.8kV-2.4kV
Z=5.73%
704TRNF871
3/C 500MCM PILC (2100')
2000/5
2000AF
BUS TIE 1-2
1200/5
4-250KMIL/PHASE EPR
TO BUS #2 CUBICLE 1B
CONTINUED ON DRAWING 13.8-BUS2
75/5
2/0 AWG PILC
603TRNF603
1000kVA
13.8kV-480V
Z=5.78%
500kcmil - 4/0
1600AF
480V (603)
480V
1000kVA
EMERGENCY/PEAK SHAVING GENERATOR
3/C 500MCM PILC (2100')
704TRNF870
TRANSFORMER # 1 (WEST)
2500/3500kVA
13.8kV-2.4kV
Z=5.57%
9-1/c #4/0
3-1/c #2/0
60,000 AMP SYM I.C.
4WAY SF-6 SWITCH (901)
150/5
3/C #2/0 PILC
MH-86
3 #2/0
TO 4WAY SF6 SWITCH BUILDING 560
SEE DRAWING 13.8-BUS2
901TRNF874
2000/2576kVA
13.8kV-2.4kV
Z=5.71%
901TRNF617
1000kVA-3ø
13.8kV-480/277V
Z=6.1%
901TRNF292
600/5
TANDEM VAN DE GRAAFF (901A)
800/5
14400/120V
TO TRANSFORMER #1 LTC
3-1/C 500MCMEPR
CABLE DISCONNECTED AT 603, 07/2001
3/C # 2/0 (2830') PILC
MHACC SPLICE
SUB-STATION 800A
800-OS-SWGR01A
TRANSFORMER #1
7500kVA
13.8/4.16kV
(NORTH)
Z=5.5%
600TRNF507
TRANSFORMER #2
7500kVA
13.8/4.16kV
(SOUTH)
Z=5.5%
600TRNF506
5kV VACUUM 1200A
250MVA 4160V
LIMITAMP CONTROL
SPARE
BUILDING 600 CHILLED WATER PLANT
600TRNF509
600TRNF508
1500kVA
4160/480V
Z=5.75%
BUS No. 2
FAN HOUSE (704)
2400V BUS No.1
2000AF
600/5
500kVA
2.4kV-480V
704 FAN HOUSE
600AF
701A ALTERNATE FEED
SEE DWG. 1A-BUS 1
480V BLDG. 701
SPARE
VAN DE GRAAFF 3 (901)
REFRIGERATOR UNITS AJ121 & AJ122 901A
300 kVA
500 kVA
480V CYCLOTRON POWER SUPPLY (FORMERLY M.G. SET)
480V HV RECTIFIER CYCLOTRON
480V BUILDING
480V VAN DE GRAAF
480V CYCLOTRON
480V 906 (901 WEST)
830-OS-001
OIL SWITCH
BAL 25 25E
830TRNF099
300kVA-3ø
13.8kV-480V
Z=4.7%
830TRNF098
600AF 600AT
25,000 AMP SYM.I.C.
480V. BUS (830)
EMH25
3-1/C #2/0
EMH26A
13E
300kVA
13.8kV-208/120V
933TRNF045
1000kVA-3ø
13.8kV-480V
Z=6.18%
830TRNF555
500kVA-3ø
13.8kV-480V
832TRNF608
500kVA-3ø
13.8kV-480V
830
832
3-#1/0
BLDG. 933
860TRNF818
1500kVA
13.8kV-480V
OA,FA
600A
817A
860
HAZARDOUS WASTE OPERATIONS BUILDING
HFBR
(750)
2400 VOLT BUS
400/5
200/5
1000kVA
2.4kV-480V
Z=8%
750TRNF136
2000AF 1600AT
RED.VOLT AUTO TRANSFORMER TYPE STARTER
400HP
600HP
750TRNF137
1000kVA
2.4kV-480V
Z=8%
480 VOLT BUS
15kV OUTDOOR METAL ENCLOSED SWITCHGEAR - SUBSTATION 661A
600A, 13.8kV BUS
600
200E
125E
150E
SPARE
TO CUB. 58 BUS NO. 2 SEE DRAWING 13.8-BUS2
3-750MCM
SUBSTATION 661
5000/7000kVA
13.8 kV-2.4kV
Z=5.8%
2000AF 2000AT
2000A, 2.4kV BUS
1200AT 1200AT
3-500MCM
5kV PADMOUNT LOAD BREAK SWITCH LOCATED 30' WEST OF MANHOLE 72 SEE DRAWING 2.4-BUS
ASMH72
518-SWGR001
#2Cu UG
MH-84
#2 COPPER IN RIGS DIRECT BURIAL
#2 ALUMINUM OVERHEAD
#2 CU UG
225
208/120V
870
480/277V
516
150
480V
539
518TRNF834
300
519TRNF835
300kVA
13.8kV - 480/277V
479TRNF550
1500kVA
13.8kV/480V-277V
Z=5.75%
TREATMENT BUILDING 518
WELL HOUSE BUILDING 519
BUILDING 479
3 #2/0
12.7X
3.18X
2-300E in 11 → 540E, 1.88 Fuse at .1 sec → 8,000A (25x FLA)
.01 sec → 20,000A (64x FLA)
300E will take 700A for 600 sec
233% (Must MAG 220% 264%)
2-250E in 11 → 454E, 1.82 Fuse at .1 sec → 6,400A (20.8x)
.01 sec → 16,200A (52x)
Would MV-90 Cable ISPR
NOTES:
1. FOR GENERAL NOTES, SEE SHEET 69-BUS
2. * BREAKERS MAY BE PARALLED FOR SWITCHING WITHOUT INTERRUPTION OF POWER
REVISED 9/1/05 SM
1 REV. FIELD CONDITION 11/13/03 WB SM
JOB NO. SHEET NO. REVISION DATE DWN. APP'D. QA
BROOKHAVEN NATIONAL LABORATORY
UNDER CONTRACT WITH
UNITED STATES DEPARTMENT OF ENERGY
PLANT ENGINEERING DIVISION
UPTON, NEW YORK 11973
JOB TITLE Electrical System One-line Diagram
DWG. TITLE Main Feeder Diagram and Relay Data 13.8kV Distribution System
PROJECT QA A4
ORIGINAL DRAWING BY D.R.H.
REDRAWN BY
FAC CIP ILR
APPROVED BY S.M.
DRAWING SCALE N.T.S.
ORIGINAL DATE DRAWN 08/26/97
DATE REDRAWN
ACCT. NO.
SHEET 2 OF 11
APPROVED "AS BUILT"
THIS DRAWING HAS BEEN REVIEWED BY PLANT ENGINEERING OPERATIONS AND MAINTANENCE AND TO THE BEST OF OUR KNOWLEDGE IS ACCURATE AND COMPLETE
PLANT ENGINEERING
MAINTENANCE MANAGEMENT CENTER
68 BELL AVENUE
BUILDING 97
JOB NO. 8720
BLDG. NO. 603
DWG. NO. 13.8-BUS1.1