



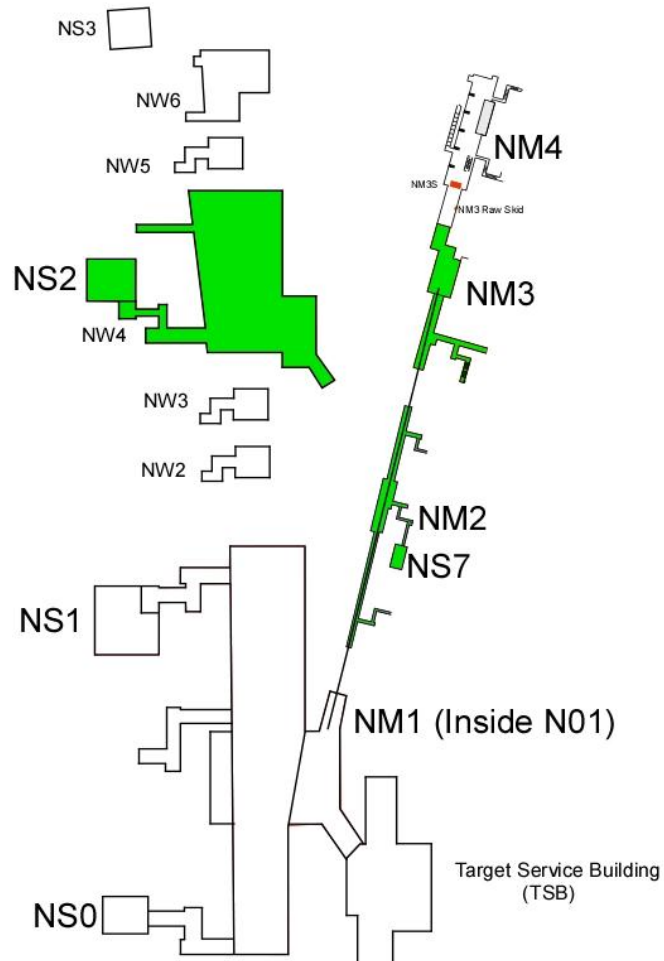
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NS2 LCW PLC information

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Fermilab - Neutrino Area LCW



NS2

Here we can see what areas, Service Buildings and enclosures, the NS2 LCW systems cover.

```

D97  NS2LCW          SET      D/A  A/D  Com-U  PTools
-<FTP>+ *SA♦ X-A/D  X=TIME      Y=R:DCCT  ,R:LI301 ,R:LI402D,R:LI522D
COMMAND BL-- Eng-U  I= .1      I= 0      , 0      , 0      , 0
-<14>+ s_RR AUTO  F= .9      F= 48     , 80     , 200    , 80
spork .... crews fish mars flomp BUNNY talos oper griz camac
F:NS2I1A  Tower 1 Fan A Motor Curr      17.44  Amps
F:NS2I1B  Tower 1 Fan B Motor Curr      16.56  Amps
F:NS2I2A  Tower 2 Fan A Motor Curr      20.25  Amps
F:NS2I2B  Tower 2 Fan B Motor Curr      20.64  Amps
F:NS2I3A  Tower 3 Fan A Motor Curr      18.79  Amps
F:NS2I3B  Tower 3 Fan B Motor Curr      18.63  Amps
F:NS2RDI  DI Lp Outlet Resistivity      2.33   Mohm
F:NS2RRT  LCW Return Resistivity        18     Mohm
F:NS2PD1  LCW Pmp 1 Dischrg Pressr      * 293   psig
F:NS2PS1  LCW Pmp 1 Suction Pressr     * 50.45  psig
F:NS2PD2  LCW Pmp 2 Dischrg Pressr     * 51.28  psig
F:NS2PS2  LCW Pmp 2 Suction Pressr     * 51.23  psig
F:NS2PD3  LCW Pmp 3 Dischrg Pressr     * 294.6  psig
F:NS2PS3  LCW Pmp 3 Suction Pressr     * 50.11  psig
F:NS2PST  Surge Tank Head Pressr       * 48.74  psig
F:NS2PAC  Air Comp supply Pressr       * 62.71  psig
F:NS2PDI  DI Loop Inlet Pressr         * 63.52  psig
F:NS2PBI  DI Bottle Inlet Pressr       * 63.42  psig
F:NS2PBO  DI Bottle Outlet Pressr      * 50.96  psig
F:NS2PDO  DI Loop Outlet Pressr        * 51.06  psig
F:NS2IP1  LCW Pmp 1 Motor Curr         91.65  Amps
F:NS2IP2  LCW Pmp 2 Motor Curr         * .11   Amps
F:NS2IP3  LCW Pmp 3 Motor Curr         99.78  Amps
F:NS2TRT  Tower Return Temp            * 92.41  degF
F:NS2TST  Tower Supply Temp            * 97.48  degF
F:NS2FDI  DI Flow                       * 14.8   GPM
F:NS2TRF  Tower Return Flow            * 479.9  GPM
F:NS2LVL  Surge Tank Level             17.82  Inch
F:NS2P3W  3-way Valve Ctrl Pressur     1.725
F:NS2STP  ESTOP Switch                  0
F:NS2TCB  LCW Cntrls Cabinet Temp      94.87
F:NS2TRM  LCW Pump Room Temp           93.32  degF
-F:NS2SUP  NS2 LCW Supply Temp           80     93.19  DegF
F:NS2RET  NS2 LCW Return Temp           97.24  DegF
F:NS2FLO  LCW Return Flow              615.8  gpm
F:NS2XPG  NS2 SurgeTank Volume,gal      84     Gal
F:NS2XPN  NS2 SurgeTank Volume,pct      75     %
F:NS2LCW  NS2 LCW System Status         S-53
F:NS2STS  NS2 Xtended LCW Sys Stat      S-53
F:NS2FLO  LCW Return Flow              615.8  gpm

```

The digital and analog status Parameters can be found on D97, “Bunny”, pages 14 & 15, NS2LCW & NS2LCW II.

Here, page 14 has most of the analog read backs.

2 very important digital status parameter are. F:NS2LCW & F:NS2STS

```

S53      DIGITAL STATUS                                ♦Pgm_Tools♦  AGG CONTRL
PARAM*  *SA♦ X-A/D  X=TIME      Y=R:DCCT   ,R:LI301  ,R:LI402D,R:LI522D  *RESET
*save   BL-- Eng-U  I= .1       I= 0       , 0       , 0       , 0       *ON
        s_RR AUTO  F= .9       F= 48      , 80      , 200     , 80     *OFF
.global .linac.. .booster ...mi... ..tev... ..sy... .p-bar... .misc... collider

F:NS2LCW  NS2 LCW System Status                      ♦See Alarm Log♦
♦More Info♦                                          ♦Ctrl-Menu♦
*** See HELP ***                                     0 ..... < S
Tower 3B           ON           1           0 .....
Tower 3A           ON           1           0 .....
Tower 2B           ON           1           0 ..... < 3
Tower 2A           ON           1           0 .....
Tower 1B           ON           1           0 Local  5
Tower 1A           ON           1           0 Alarm is
System Summation   OK           1           0 ACTIVE-OK
LCW Return Temperature OK       0           0 Speech is
LCW Supply Temperature OK       0           0 BYPASSED
System Pressure    OK           0           0 Edit
Air Pressure @ Compressr OK       0           0
Total System Flow OK           0 < not critical call tech 0
Pump #3           ON           1           0
Pump #2           OFF          0           0
Pump #1           ON           1           0

```

Messages

Here are the status bits that come through F:NS2LCW. The system uses 2 pumps, so a pump will always be off.

```

S53      DIGITAL STATUS                               ◆Pgm_Tools◆  AGG CONTRL
PARAM*  *SA◆ X-A/D  X=TIME      Y=R:DCCT   ,R:LI301  ,R:LI402D,R:LI522D  *RESET
*save   BL-- Eng-U  I= .1       I= 0      , 0      , 0      , 0      *ON
        s_RR AUTO  F= .9       F= 48     , 80     , 200    , 80     *OFF
.global .linac.. .booster ...mi... ..tev.. ...sy... .p-bar... .misc... collider

```

```

F:NS2STS  NS2 Xtended LCW Sys Stat  ◆See Alarm Log◆

```

```

◆More Info◆

```

ESTOP	OK	0	0 < S
Tower 3B Tripped	OK	0	0
Tower 3A Tripped	OK	0	0 -
Tower 2B Tripped	OK	0	0 < 3
Tower 2A Tripped	OK	0	0
Tower 1B Tripped	OK	0	0	Local 5
Tower 1A Tripped	OK	0	0	Alarm is
I0 Fault	OK	0	0	ACTIVE-OK
DI Resistivity Low Trip	OK	0	0	Speech is
Retrn Resistivity Low Trp	OK	0	0	BYPASSED
Surge Tank Low Low Low	OK	0	0	Edit
Surge Tank Low Low	OK	0	0	
Surge Tank Low	OK	0	0	
Pump #3 Tripped	OK	0	0	
Pump #2 Tripped	OK	0	0	
Pump #1 Tripped	OK	0	0	

```

Messages

```

Here you can see the status bits that come through F:NS2STS

```
PC D97 Test Parameters
D97 NS2LCW II SET D/A A/D Com-U PTools
-<FTP>+ *SA X-A/D X=TIME Y=R:DCCT ,R:LI301 ,R:LI402D
COMMAND BL-- Eng-U I= .1 I= 0 , 0 , 0
-<15>+ s_RR AUTO F= .9 F= 48 , 80 , 200
spork .... crews fish mars floop BUNNY talos oper griz camac
F:NS2CT0 Pump Pair #1 & #2 ON/off
F:NS2CT1 Pump Pair #1 & #3 ON/off
F:NS2CT2 Pump Pair #2 & #3 ON/off
F:NS2CT3 Reset Total Sys Flow Alm
F:NS2CT4 Reset Air Pressure Alm
F:NS2CT5 Reset Sys Pressure Alm
F:NS2CT6 Reset Supply Temp Alm
F:NS2CT7 Reset Return Temp Alm
F:NS2CT8 Reset Sys Summation
F:NS2CT9 Tower #1A ON/off
F:NS2CTA Tower #1B ON/off
F:NS2CTB Tower #2A ON/off
F:NS2CTC Tower #2B ON/off
F:NS2CTD Tower #3A ON/off
F:NS2CTE Tower #3B ON/off

F:NS2RS0 Reset Pump #1 Trip
F:NS2RS1 Reset Pump #2 Trip
F:NS2RS2 Reset Pump #3 Trip
F:NS2RS3 Reset Surge Tnk Lo
F:NS2RS4 Reset Surge Tnk LoLo
F:NS2RS5 Reset Surge Tnk LoLoLo
F:NS2RS6 Reset Ret Resistivty Trp
F:NS2RS7 Reset DI Resist Trip
F:NS2RS9 Reset Tower #1A Trip
F:NS2RSA Reset Tower #1B Trip
F:NS2RSB Reset Tower #2A Trip
F:NS2RSC Reset Tower #2B Trip
F:NS2RSD Reset Tower #3A Trip
F:NS2RSE Reset Tower #3B Trip
F:NS2RSF Reset ESTOP Indication

F:NS2RRT LCW Return Resistivity 18 Mohm
F:NS2RDI DI Lp Outlet Resistivity 2.334 Mohm

F:NS7DFP NS7 DIFF PRESSURE 50.49 psi
```

Subpage 15 has most of digital status parameters.

Here you are able to reset the tripped bit via the parameter.

Notice the invisible bits that you can click on to get the Digital Status box to reset the bit.

WARNING: Some parameters have Run/Stop options, don't click on any bit unless you know what you're doing.

```

S53 DIGITAL STATUS
PARAM* *SA X-A/D X=TIME Y=R:DCCT ,R:LI301 ,R:LI402D,R:LI522D
*save BL-- Eng-U I= .1 I= 0 , 0 , 0 , 0
s_RR AUTO F= .9 F= 48 , 80 , 200 , 80
.global .linac.. .booster ...mi... ..tev... ..sy... .p-bar... .misc... collider

F:NS2LCW NS2 LCW System Status
◆More Info◆
*** See HELP ***
Tower 3B ON 1
Tower 3A ON 1
Tower 2B ON 1
Tower 2A ON 1
Tower 1B ON 1
Tower 1A ON 1
System Summation OK 1
LCW Return Temperature OK 0
LCW Supply Temperature HIGH 1
System Pressure OK 0
Air Pressure @ Compressr OK 0
Total System Flow OK 0 < not critical call tech
Pump #3 ON 1
Pump #2 OFF 0
Pump #1 ON 1

```

The NS2LCW Supply Temperature high bit has come into alarm. It won't trip the LCW system, but it will pull the permit to run the NM2 power supplies at NS7, which include the FMAG and KMAG supplies.

```

D97 NS2LCW II SET D/A A/D Com-U PTools
-<FTP>+ *SA X-A/D X=TIME Y=R:DCCT ,R:LI301 ,R:LI402D
COMMAND BL-- Eng-U I= .1 I= 0 , 0 , 0
-<15>+ s_RR AUTO F= .9 F= 48 , 80 , 200
spork .... crews fish mars flomp BUNNY talos oper griz camac
F:NS2CT0 Pump Pair #1 & #2 ON/off
F:NS2CT1 Pump Pair #1 & #3 ON/off
F:NS2CT2 Pump Pair #2 & #3 ON/off
F:NS2CT3 Reset Total Sys Flow Alm
F:NS2CT4 Reset Air Pressure Alm
F:NS2CT5 Reset Sys Pressure Alm
F:NS2CT6 Reset Supply Temp Alm
F:NS2CT7 Reset Return Temp Alm
F:NS2CT8 Reset Sys Summation
F:NS2CT9 Tower #1A ON/off
F:NS2CTA Tower #1B ON/off
F:NS2CTB Tower #2A ON/off
F:NS2CTC Tower #2B ON/off
F:NS2CTD Tower #3A ON/off
F:NS2CTE Tower #3B ON/off

F:NS2RS0 Reset Pump #1 Trip
F:NS2RS1 Reset Pump #2 Trip
F:NS2RS2 Reset Pump #3 Trip
F:NS2RS3 Reset Surge Tnk Lo
F:NS2RS4 Reset Surge Tnk LoLo
F:NS2RS5 Reset Surge Tnk LoLoLo
F:NS2RS6 Reset Ret Resistivity Trp
F:NS2RS7 Reset DI Resist Trip
F:NS2RS9 Reset Tower #1A Trip
F:NS2RSA Reset Tower #1B Trip
F:NS2RSB Reset Tower #2A Trip
F:NS2RSC Reset Tower #2B Trip
F:NS2RSD Reset Tower #3A Trip
F:NS2RSE Reset Tower #3B Trip
F:NS2RSF Reset ESTOP Indication

F:NS2RRT LCW Return Resistivity 18 Mohm
F:NS2RDI DI Lp Outlet Resistivity 2.334 Mohm

F:NS7DFP NS7 DIFF PRESSURE 49.81 psi
    
```

Digital Status
Reset

Once the Supply Temperature read back is below it's trip point you can reset the bit.


```

S53      DIGITAL STATUS                               ◆Pgm_Tools◆  AGG CONTRL
PARAM*  *SA◆ X-A/D  X=TIME      Y=R:DCCT   ,R:LI301  ,R:LI402D,R:LI522D  *RESET
*save   BL-- Eng-U  I= .1       I= 0      , 0      , 0      , 0      *ON
        s_RR AUTO  F= .9       F= 48     , 80     , 200    , 80     *OFF
.global .linac.. .booster ...mi... ..tev... ..sy... .p-bar... .misc... collider

```

F:NS2LCW NS2 LCW System Status ◆See Alarm Log◆

◆More Info◆

◆Ctrl-Menu◆

```

*** See HELP ***                                0
Tower 3B                                         ON      1      0 ..... < S
Tower 3A                                         ON      1      0 ..... -
Tower 2B                                         ON      1      0 ..... < 3
Tower 2A                                         ON      1      0 .....
Tower 1B                                         ON      1      0 Local  5
Tower 1A                                         ON      1      0 Alarm is
System Summation                               OK      1      0 ACTIVE-OK
LCW Return Temperature                         OK      0      0 Speech is
LCW Supply Temperature                         OK      0      0 BYPASSED
System Pressure                               OK      0      0 Edit
Air Pressure @ Compressor                     OK      0      0
Total System Flow                             OK      0 < not critical call tech 0
Pump #3                                        ON      1      0
Pump #2                                        OFF     0      0
Pump #1                                        ON      1      0

```

Messages

Now good, or OK

```

S53      DIGITAL STATUS                               ◆Pgm_Tools◆  AGG CONTRL
PARAM*   *SA◆ X-A/D  X=TIME      Y=R:DCCT   ,R:LI301  ,R:LI402D,R:LI522D  *RESET
*save    BL-- Eng-U  I= .1        I= 0       , 0       , 0       , 0       *ON
          s_RR AUTO  F= .9        F= 48      , 80      , 200     , 80     *OFF
.global. .linac.. .booster ...mi... ..tev.. ...sy... .p-bar... .misc... collider

```

```

F:NS2STS  NS2 Xtended LCW Sys Stat  ◆See Alarm Log◆

```

```

◆More Info◆

```

```

ESTOP                OK          0
Tower 3B Tripped     OK          0
Tower 3A Tripped     OK          0
Tower 2B Tripped     OK          0
Tower 2A Tripped     OK          0
Tower 1B Tripped     OK          0
Tower 1A Tripped     OK          0
IO Fault             OK          0
DI Resistivity Low Trip OK       0
Retrn Resistivity Low Trp OK       0
Surge Tank Low Low Low OK       0
Surge Tank Low Low  OK       0
Surge Tank Low      OK       0
Pump #3 Tripped     OK       0
Pump #2 Tripped     OK       0
Pump #1 Tripped     OK       0

```

```

Messages

```

In our case none of these bits were tripped.

```

D97 NS2LCW II          SET      D/A  A/D  Com-U  ♦PTools♦
-<FTP>+ *SA♦ X-A/D  X=TIME      Y=R:DCCT  ,R:LI301 ,R:LI402D
COMMAND BL-- Eng-U  I= .1      I= 0      , 0      , 0
-<15>+ s_RR AUTO  F= .9      F= 48     , 80     , 200
spork .... crews fish mars flomp BUNNY talos oper griz camac
F:NS2CT0      Pump Pair #1 & #2 ON/off
F:NS2CT1      Pump Pair #1 & #3 ON/off
F:NS2CT2      Pump Pair #2 & #3 ON/off
F:NS2CT3      Reset Total Sys Flow Alm
F:NS2CT4      Reset Air Pressure Alm
F:NS2CT5      Reset Sys Pressure Alm
F:NS2CT6      Reset Supply Temp Alm
F:NS2CT7      Reset Return Temp Alm
F:NS2CT8      Reset Sys Summation
F:NS2CT9      Tower #1A ON/off
F:NS2CTA      Tower #1B ON/off
F:NS2CTB      Tower #2A ON/off
F:NS2CTC      Tower #2B ON/off
F:NS2CTD      Tower #3A ON/off
F:NS2CTE      Tower #3B ON/off

F:NS2RS0      Reset Pump #1 Trip
F:NS2RS1      Reset Pump #2 Trip
F:NS2RS2      Reset Pump #3 Trip
F:NS2RS3      Reset Surge Tnk Lo
F:NS2RS4      Reset Surge Tnk LoLo
F:NS2RS5      Reset Surge Tnk LoLoLo
F:NS2RS6      Reset Ret Resistivty Trp
F:NS2RS7      Reset DI Resist Trip
F:NS2RS9      Reset Tower #1A Trip
F:NS2RSA      Reset Tower #1B Trip
F:NS2RSB      Reset Tower #2A Trip
F:NS2RSC      Reset Tower #2B Trip
F:NS2RSD      Reset Tower #3A Trip
F:NS2RSE      Reset Tower #3B Trip
F:NS2RSF      Reset ESTOP Indication

F:NS2RRT      LCW Return Resistivity      18      Mohm
F:NS2RDI      DI Lp Outlet Resistivity  2.343  Mohm

F:NS7DFP      NS7 DIFF PRESSURE      49.75  psi

```

Digital Status

Reset

Still can't turn on the NM2 power supplies, there's one more bit you must reset.

The System Summation needs a reset.

Now you can turn on the NS7 power supplies and inform SeaQuest they can turn on F:NM3S (FMAG) & F:NM4AN (KMAG). Once they are on you can enable the Neutrino CDC and send them beam.