

# LTU & Beam Dump Installation Readiness Review

## Magnet Power Supplies Phase 4 Installation

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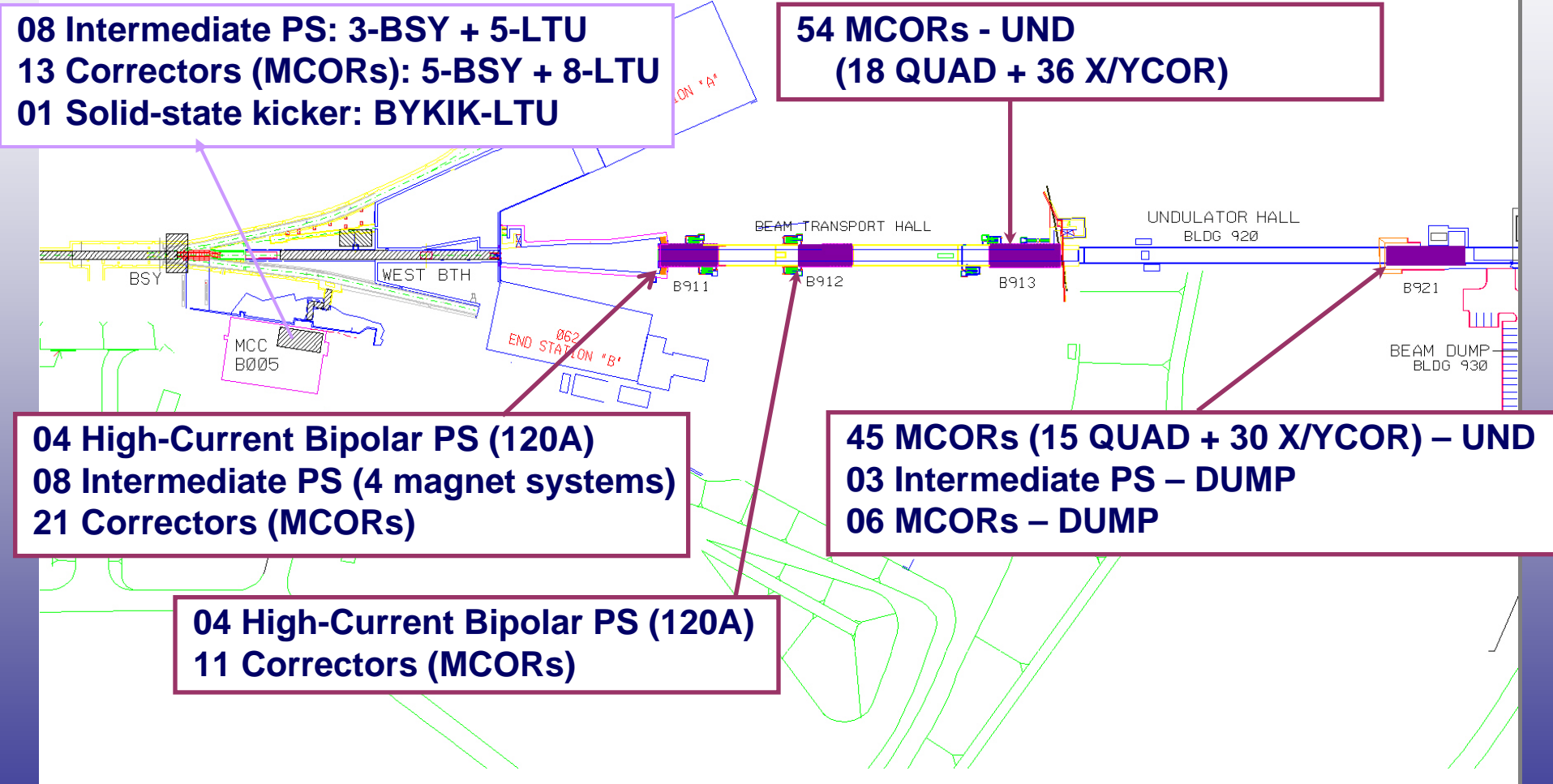
# Magnet PS Phase 4 Installation – Agenda

- Installation Program
- Rack profiles
- Overall schedule
- Procurement status
- Rack readiness
- Installation Documentation
- Project Staff
- Open items
- Lessons learned - 2007 downtime experience

# Magnet PS – PH4 Installation Program

- B005 – BSY + LTU
  - 08 Intermediate PS: 3-BSY + 5-LTU
  - 13 Correctors (MCORs): 5-BSY + 8-LTU
  - 01 Solid-state kicker: BYKIK-LTU
- B911 - LTU
  - 04 High-Current Bipolar PS (120A)
  - 08 Intermediate PS (4 magnet systems)
  - 21 Correctors (MCORs)
- B912 – LTU
  - 04 High-Current Bipolar PS (120A)
  - 11 Correctors (MCORs)
- B913 – UND
  - 54 MCORs (18 QUAD + 36 X/YCOR)
- B921 – UND + DUMP
  - 45 MCORs (15 QUAD + 30 X/YCOR) – UND
  - 03 Intermediate PS – DUMP
  - 06 MCORs – DUMP

# Magnet PS - PH4 Installation Program



# Magnet PS Installation Program – B005

B005-L06

B005-L05

B005-L04

B005-L03

B005-L02

B005-L01

GROUND BUS	48	GROUND BUS	48	GROUND BUS	48	GROUND BUS	48	GROUND BUS	48
BLANK	47	BLANK	47	BLANK	47	BLANK	47	BLANK	47
NEUTRAL BUS	46	NEUTRAL BUS	46	NEUTRAL BUS	46	NEUTRAL BUS	46	NEUTRAL BUS	46
BLANK	45	BLANK	45	BLANK	45	BLANK	45	BLANK	45
AC DISTRIBUTION	44	AC DISTRIBUTION	44	AC DISTRIBUTION	44	AC DISTRIBUTION	44	AC DISTRIBUTION	44
	43		43		43		43		43
480VAC	42	480VAC	42	480VAC	42	480VAC	42	208 VAC	42
CIRCUIT	41	CIRCUIT	41	CIRCUIT	41	CIRCUIT	41	CIRCUIT	41
BREAKERS	40	BREAKERS	40	BREAKERS	40	BREAKERS	40	BREAKERS	40
	39		39		39		39		39
BLANK	38	BLANK	38	BLANK	38	BLANK	38	BLANK	38
	37		37		37		37		37
MCOR PLC	36	RESERVED	36	DIGI PORT SERVER	36	BLANK	36	BYKIK	36
384-801	35		35	CABLE FEED THRU	35	RESERVED	35	KICKER PLC	35
	34		34	BLANK	34	CABLE FEED THRU	34	384-804	34
CABLE FEED THRU	33	CABLE FEED THRU	33	LCLS CAT6 PP	33	EPSC Q5	33		33
	32	BLANK	32	CABLE FEED THRU	32	EPSC Q6	32	BLANK	32
BLANK	31	CABLE FEED THRU	31	EPSC QVM3	31	CABLE FEED THRU	31		31
	30	BLANK	30	CABLE FEED THRU	30	EPSC QAO	30	BYKIK	30
	29	BLANK	29	EPSC QVM4	29	BLANK	29	KICKER	29
	28	BLANK	28	BLANK	28		28	EI-384-041-10	28
	27		27		27		27		27
TRANSDUCTORS	26	TRANSDUCTORS	26	TRANSDUCTORS	26	TRANSDUCTORS	26		26
	25		25		25		25		25
BLANK	24	BLANK	24	BLANK	24	BLANK	24		24
	23		23		23		23		23
MINI VME	22	MINI VME	22		22		22		22
CRATE	21	CRATE	21		21		21		21
LTU	20	LTU	20		20		20		20
	19		19		19		19		19
CABLE FEED-THRU	18	CABLE FEED-THRU	18		18	ENET PS CTRL	18		18
	17		17		17	TO GENESYS PS	17		17
MINI VME	16	MINI VME	16		16	BLANK	16	Ⓢ BULK PS BYKIK	16
CRATE	15	CRATE	15		15		15		15
BSY	14	BSY	14	QVB1 THRU QVB3	14		14		14
	13		13	60V, 165A, 10KW	13		13		13
	12		12	IE POWER*	12		12		12
	11		11	EI-384-041-42	11	Q5 EI-384-031-22	11		11
	10		10		10	BLANK	10		10
MCOR BULK PS 2	09	BLANK	09	QVM1	09	Q6 EI-384-031-21	09		09
60V, 165A, 10KW	08		08	60V, 165A, 10KW	08	BLANK	08		08
LAMBDA-EMI ESS	07		07	IE POWER*	07		07		07
EI-384-141-61	06		06	EI-384-041-41	06	QAO EI-384-031-20	06		06
	05		05		05		05		05
MCOR BULK PS 1	04		04	QVM2	04	BLANK	04		04
60V, 165A, 10KW	03		03	160V, 93A, 15KW	03		03		03
LAMBDA-EMI ESS	02		02	IE POWER* 9250J7	02		02		02
EI-384-131-60	01		01	EI-384-041-40	01		01		01

08 Intermediate

- 3 - BSY
- 5 - LTU

13 MCORs

- 5 - BSY
- 8 - LTU

01 Solid state kicker

- BYKIK-LTU



# Magnet PS Installation Program – B911

B911-10	B911-11	B911-12	B911-13	B911-14	B911-15
49 48 47 46 45 44 43 42 41 40 39 38 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 09 08 07 06 05 04 03 02 01	49 48 47 46 45 44 43 42 41 40 39 38 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 09 08 07 06 05 04 03 02 01	49 48 47 46 45 44 43 42 41 40 39 38 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 09 08 07 06 05 04 03 02 01	49 48 47 46 45 44 43 42 41 40 39 38 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 09 08 07 06 05 04 03 02 01	49 48 47 46 45 44 43 42 41 40 39 38 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 09 08 07 06 05 04 03 02 01	49 48 47 46 45 44 43 42 41 40 39 38 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 09 08 07 06 05 04 03 02 01
BLANK	GROUND BUS BLANK NEUTRAL BUS BLANK AC DISTRIBUTION	GROUND BUS BLANK NEUTRAL BUS BLANK AC DISTRIBUTION	BLANK	GROUND BUS BLANK NEUTRAL BUS BLANK AC DISTRIBUTION	
480VAC CIRCUIT BREAKER	480VAC CIRCUIT BREAKER	480VAC CIRCUIT BREAKER	480VAC CIRCUIT BREAKER	480VAC CIRCUIT BREAKER	
RESERVED	BLANK	DIGI PORT SERVER CABLE FEED THRU CABLE FEED THRU LCLS CAT6 PP CABLE FEED THRU BLANK RESERVED CABLE FEED THRU EPSC QDL31-QDL34	BLANK	BLANK	
EPSC QEM1 CABLE FEED THRU EPSC QEM2 EPSC QEM3 CABLE FEED THRU EPSC QEM4	RESERVED EPSC QT11-QT43 CABLE FEED THRU EPSC QT12-QT42		MCOR AND QEM PLC 384-801	BLANK RESERVED CABLE FEED THRU EPSC BX31-36; BYD1-3	
BLANK	BLANK	BLANK	BLANK	BLANK	
TRANSDUCTORS	TRANSDUCTORS	TRANSDUCTORS	MINI VME CRATE	TRANSDUCTORS	
BLANK	BLANK	BLANK	CABLE FEED THRU BLANK		
COPLEY CRATE SLOT 1 SLOT 2 SLOT 3 QEM1 QEM3	QT11,13,21,23 31,33,41,43 160V 93A,15KW IE PWR# 9250J7 EI-384-042-21	BLANK	MCOR INTERFACE YD132 MCOR 32 YD134 MCOR 34 YD136 MCOR 36 YD138 MCOR 38 YD140 MCOR 40 YD142 MCOR 42 YD144 MCOR 44 YD146 MCOR 46 YD148 MCOR 48 YD150 MCOR 50 YD152 MCOR 52 YD154 MCOR 54 YD156 MCOR 56 YD158 MCOR 58 YD160 MCOR 60 YD162 MCOR 62 YD164 MCOR 64 YD166 MCOR 66 YD168 MCOR 68 YD170 MCOR 70 YD172 MCOR 72 YD174 MCOR 74 YD176 MCOR 76 YD178 MCOR 78 YD180 MCOR 80 YD182 MCOR 82 YD184 MCOR 84 YD186 MCOR 86 YD188 MCOR 88 YD190 MCOR 90 YD192 MCOR 92 YD194 MCOR 94 YD196 MCOR 96 YD198 MCOR 98 YD200 MCOR 100	BLANK	
COPLEY CRATE SLOT 1 SLOT 2 SLOT 3 QEM2 QEM4	QT11,13,21,23 31,33,41,43 160V 93A,15KW IE PWR# 9250J7 EI-384-042-21		BLOWER	BLANK	
BULK POWER SUPPLY 100V,150A,15KW LAMBDA-EMI ESS EI-384-042-10	QT12,22,32,42 100V,150A,15KW IE PWR# 9250H7 EI-384-042-20	QDL 31,32,33,34 50V,200A,10KW IE PWR# 9250H7 EI-384-042-30	MCOR INTERFACE YD132 MCOR 32 YD134 MCOR 34 YD136 MCOR 36 YD138 MCOR 38 YD140 MCOR 40 YD142 MCOR 42 YD144 MCOR 44 YD146 MCOR 46 YD148 MCOR 48 YD150 MCOR 50 YD152 MCOR 52 YD154 MCOR 54 YD156 MCOR 56 YD158 MCOR 58 YD160 MCOR 60 YD162 MCOR 62 YD164 MCOR 64 YD166 MCOR 66 YD168 MCOR 68 YD170 MCOR 70 YD172 MCOR 72 YD174 MCOR 74 YD176 MCOR 76 YD178 MCOR 78 YD180 MCOR 80 YD182 MCOR 82 YD184 MCOR 84 YD186 MCOR 86 YD188 MCOR 88 YD190 MCOR 90 YD192 MCOR 92 YD194 MCOR 94 YD196 MCOR 96 YD198 MCOR 98 YD200 MCOR 100	BX31-36; BYD1-3 45V, 330A, 15KW IE PWR# 9250J6 EI-384-042-40	
	QT12,22,32,42 100V,150A,15KW IE PWR# 9250H7 EI-384-042-20	QDL 31,32,33,34 50V,200A,10KW IE PWR# 9250H7 EI-384-042-30	BLOWER	BX31-36; BYD1-3 45V, 330A, 15KW IE PWR# 9250J6 EI-384-042-40	
			MCOR BULK PS 1 50V,165A,10KW LAMBDA - EMI ESS EI-384-141-40	BX31-36; BYD1-3 45V, 330A, 15KW IE PWR# 9250J6 EI-384-042-40	

## 04 High-Curr Bipolar

## 08 Intermediate

## 21 MCORs

MCOR INTERFACE	
YCQT32	MCOR 12 0
YCDL4	MCOR 12 1
XCQT42	MCOR 12 2
YCQT42	MCOR 12 3
YCEM1	MCOR 12 4
XCEM2	MCOR 12 5
YCEM3	MCOR 12 6
QEM3V	MCOR 12 7
XCEM4	MCOR 12 8
	SPARE 9
	SPARE 10
	SPARE 11
	SPARE 12
	SPARE 13
	SPARE 14
	SPARE 15

MCOIR INTERFACE	
BOX31 BTRM	MCOIR 6 0
YC0L1	MCOIR 12 1
BOX32 BTRM	MCOIR 6 2
XC0T12	MCOIR 12 3
YC0T12	MCOIR 12 4
YC0L2	MCOIR 12 5
XC0T22	MCOIR 12 6
YC0T22	MCOIR 12 7
BOX35 BTRM	MCOIR 6 8
YC0L3	MCOIR 12 9
BOX36 BTRM	MCOIR 6 10
XC0T32	MCOIR 12 11
	SPARE
	SPARE
	SPARE
	SPARE

# Magnet PS Installation Program – B912

## 04 High-Curr Bipolar

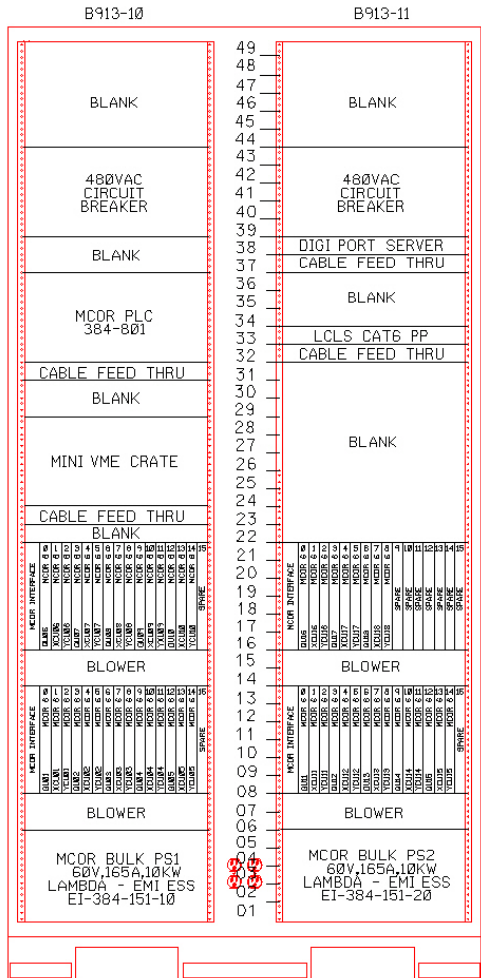
11 MCORs

B912-10	B912-11	B912-12	B912-13
BLANK	BLANK	BLANK	
480VAC CIRCUIT BREAKER	480VAC CIRCUIT BREAKER		
RESERVED	BLANK	DIGI PORT SERVER	
EPSC QUM1	MCOR AND QUM PLC 384-801	CABLE FEED THRU	
CABLE FEED THRU		CABLE FEED THRU	
EPSC QUM2		LCLS CAT6 PP	
EPSC QUM3		CABLE FEED THRU	
CABLE FEED THRU	CABLE FEED THRU		
EPSC QUM4	BLANK		
BLANK			
TRANSDUCTORS	MINI VMC CRATE	BLANK	SPARE
BLANK	CABLE FEED THRU		
	BLANK		
	MCOR INTERFACE		
	MCOR 2B		
	MCOR 1A		
	MCOR 1B		
	MCOR 1C		
	MCOR 1D		
	MCOR 1E		
	MCOR 1F		
	MCOR 1G		
	MCOR 1H		
	MCOR 1I		
	MCOR 1J		
	MCOR 1K		
	MCOR 1L		
	MCOR 1M		
	MCOR 1N		
	MCOR 1O		
	MCOR 1P		
	MCOR 1Q		
	MCOR 1R		
	MCOR 1S		
	MCOR 1T		
	MCOR 1U		
	MCOR 1V		
	MCOR 1W		
	MCOR 1X		
	MCOR 1Y		
	MCOR 1Z		
	MCOR 1AA		
	MCOR 1AB		
	MCOR 1AC		
	MCOR 1AD		
	MCOR 1AE		
	MCOR 1AF		
	MCOR 1AG		
	MCOR 1AH		
	MCOR 1AI		
	MCOR 1AJ		
	MCOR 1AK		
	MCOR 1AL		
	MCOR 1AM		
	MCOR 1AN		
	MCOR 1AO		
	MCOR 1AP		
	MCOR 1AQ		
	MCOR 1AR		
	MCOR 1AS		
	MCOR 1AT		
	MCOR 1AU		
	MCOR 1AV		
	MCOR 1AW		
	MCOR 1AX		
	MCOR 1AY		
	MCOR 1AZ		
	MCOR 1BA		
	MCOR 1BB		
	MCOR 1BC		
	MCOR 1BD		
	MCOR 1BE		
	MCOR 1BF		
	MCOR 1BG		
	MCOR 1BH		
	MCOR 1BI		
	MCOR 1BJ		
	MCOR 1BK		
	MCOR 1BL		
	MCOR 1BM		
	MCOR 1BN		
	MCOR 1BO		
	MCOR 1BP		
	MCOR 1BQ		
	MCOR 1BR		
	MCOR 1BS		
	MCOR 1BT		
	MCOR 1BU		
	MCOR 1BV		
	MCOR 1BW		
	MCOR 1BX		
	MCOR 1BY		
	MCOR 1BZ		
	MCOR 1CA		
	MCOR 1CB		
	MCOR 1CC		
	MCOR 1CD		
	MCOR 1CE		
	MCOR 1CF		
	MCOR 1CG		
	MCOR 1CH		
	MCOR 1CI		
	MCOR 1CJ		
	MCOR 1CK		
	MCOR 1CL		
	MCOR 1CM		
	MCOR 1CN		
	MCOR 1CO		
	MCOR 1CP		
	MCOR 1CQ		
	MCOR 1CR		
	MCOR 1CS		
	MCOR 1CT		
	MCOR 1CU		
	MCOR 1CV		
	MCOR 1CW		
	MCOR 1CX		
	MCOR 1CY		
	MCOR 1CZ		

MCOR INTERFACE	
Q31,32,33	MCOR 30
Q34,35,36	
XCE31	MCOR 12
YCE32	MCOR 12
XCE33	MCOR 12
YCE34	MCOR 12
XCE35	MCOR 12
YCE36	MCOR 12
XCUM1	MCOR 12
YCUM2	MCOR 12
YCUM3	MCOR 12
XCUM4	MCOR 12
	SPARE
	SPARE
	SPARE
	SPARE

# Magnet PS Installation Program – B913

54 MCORs



B913-10

UND1

MCOR INTERFACE	MCOR 6 0	MCOR 6 1	MCOR 6 2	MCOR 6 3	MCOR 6 4	MCOR 6 5	MCOR 6 6	MCOR 6 7	MCOR 6 8	MCOR 6 9	MCOR 6 10	MCOR 6 11	MCOR 6 12	MCOR 6 13	MCOR 6 14	MCOR 6 15
QU06																
YCU06																
YCU06																
QU07																
YCU07																
QU08																
YCU08																
YCU08																
QU09																
YCU09																
YCU09																
QU10																
YCU10																
YCU10																
SPARE																

UND1

MCOR INTERFACE	MCOR 6 0	MCOR 6 1	MCOR 6 2	MCOR 6 3	MCOR 6 4	MCOR 6 5	MCOR 6 6	MCOR 6 7	MCOR 6 8	MCOR 6 9	MCOR 6 10	MCOR 6 11	MCOR 6 12	MCOR 6 13	MCOR 6 14	MCOR 6 15
QU01																
YCU01																
YCU01																
QU02																
YCU02																
YCU02																
QU03																
YCU03																
YCU03																
QU04																
YCU04																
YCU04																
QU05																
YCU05																
YCU05																
SPARE																

B913-11

UND1

MCOR INTERFACE	MCOR 6 0	MCOR 6 1	MCOR 6 2	MCOR 6 3	MCOR 6 4	MCOR 6 5	MCOR 6 6	MCOR 6 7	MCOR 6 8	MCOR 6 9	MCOR 6 10	MCOR 6 11	MCOR 6 12	MCOR 6 13	MCOR 6 14	MCOR 6 15
QU16																
YCU16																
YCU16																
QU17																
YCU17																
YCU17																
QU18																
YCU18																
YCU18																
SPARE																
SPARE																
SPARE																
SPARE																
SPARE																
SPARE																

UND1

MCOR INTERFACE	MCOR 6 0	MCOR 6 1	MCOR 6 2	MCOR 6 3	MCOR 6 4	MCOR 6 5	MCOR 6 6	MCOR 6 7	MCOR 6 8	MCOR 6 9	MCOR 6 10	MCOR 6 11	MCOR 6 12	MCOR 6 13	MCOR 6 14	MCOR 6 15
QU11																
YCU11																
YCU11																
QU12																
YCU12																
YCU12																
QU13																
YCU13																
YCU13																
QU14																
YCU14																
YCU14																
QU15																
YCU15																
YCU15																
SPARE																



# Magnet PS Installation Program – B921

03 Intermediate  
45 MCORs – UND  
06 MCORs - DUMP

B921-10	B921-11	B921-12	B921-13
BLANK	GROUND BUS	GROUND BUS	GROUND BUS
	BLANK	BLANK	BLANK
	NEUTRAL BUS	NEUTRAL BUS	NEUTRAL BUS
	BLANK	BLANK	BLANK
	AC DISTRIBUTION	AC DISTRIBUTION	AC DISTRIBUTION
480VAC CIRCUIT BREAKER	480VAC CIRCUIT BREAKERS	480VAC CIRCUIT BREAKERS	480VAC CIRCUIT BREAKERS
BLANK	BLANK		BLANK
MCOR UNDI PLC 384-801	MCOR DUMP PLC 384-801		EPSC Q2E2 CABLE FEED THRU
CABLE FEED THRU	CABLE FEED THRU	BLANK	EPSC Q2E1
BLANK	BLANK	BLANK	MINI VME CRATE
MCOR INTERFACE M1C7 M1C8 M1C9 M1D1 M1D2 M1D3 M1D4 M1D5 M1D6 M1D7 M1D8 M1D9 M1D10 M1D11 M1D12 M1D13 M1D14 M1D15 M1D16 M1D17 M1D18 M1D19 M1D20 M1D21 M1D22 M1D23 M1D24 M1D25 M1D26 M1D27 M1D28 M1D29 M1D30 M1D31 M1D32 M1D33 M1D34 M1D35 M1D36 M1D37 M1D38 M1D39 M1D40 M1D41 M1D42 M1D43 M1D44 M1D45 M1D46 M1D47 M1D48 M1D49 M1D50 M1D51 M1D52 M1D53 M1D54 M1D55 M1D56 M1D57 M1D58 M1D59 M1D60 M1D61 M1D62 M1D63 M1D64 M1D65 M1D66 M1D67 M1D68 M1D69 M1D70 M1D71 M1D72 M1D73 M1D74 M1D75 M1D76 M1D77 M1D78 M1D79 M1D80 M1D81 M1D82 M1D83 M1D84 M1D85 M1D86 M1D87 M1D88 M1D89 M1D90 M1D91 M1D92 M1D93 M1D94 M1D95 M1D96 M1D97 M1D98 M1D99 M1D100 M1D101 M1D102 M1D103 M1D104 M1D105 M1D106 M1D107 M1D108 M1D109 M1D110 M1D111 M1D112 M1D113 M1D114 M1D115 M1D116 M1D117 M1D118 M1D119 M1D120 M1D121 M1D122 M1D123 M1D124 M1D125 M1D126 M1D127 M1D128 M1D129 M1D130 M1D131 M1D132 M1D133 M1D134 M1D135 M1D136 M1D137 M1D138 M1D139 M1D140 M1D141 M1D142 M1D143 M1D144 M1D145 M1D146 M1D147 M1D148 M1D149 M1D150 M1D151 M1D152 M1D153 M1D154 M1D155 M1D156 M1D157 M1D158 M1D159 M1D160 M1D161 M1D162 M1D163 M1D164 M1D165 M1D166 M1D167 M1D168 M1D169 M1D170 M1D171 M1D172 M1D173 M1D174 M1D175 M1D176 M1D177 M1D178 M1D179 M1D180 M1D181 M1D182 M1D183 M1D184 M1D185 M1D186 M1D187 M1D188 M1D189 M1D190 M1D191 M1D192 M1D193 M1D194 M1D195 M1D196 M1D197 M1D198 M1D199 M1D200 M1D201 M1D202 M1D203 M1D204 M1D205 M1D206 M1D207 M1D208 M1D209 M1D210 M1D211 M1D212 M1D213 M1D214 M1D215 M1D216 M1D217 M1D218 M1D219 M1D220 M1D221 M1D222 M1D223 M1D224 M1D225 M1D226 M1D227 M1D228 M1D229 M1D230 M1D231 M1D232 M1D233 M1D234 M1D235 M1D236 M1D237 M1D238 M1D239 M1D240 M1D241 M1D242 M1D243 M1D244 M1D245 M1D246 M1D247 M1D248 M1D249 M1D250 M1D251 M1D252 M1D253 M1D254 M1D255 M1D256 M1D257 M1D258 M1D259 M1D260 M1D261 M1D262 M1D263 M1D264 M1D265 M1D266 M1D267 M1D268 M1D269 M1D270 M1D271 M1D272 M1D273 M1D274 M1D275 M1D276 M1D277 M1D278 M1D279 M1D280 M1D281 M1D282 M1D283 M1D284 M1D285 M1D286 M1D287 M1D288 M1D289 M1D290 M1D291 M1D292 M1D293 M1D294 M1D295 M1D296 M1D297 M1D298 M1D299 M1D300 M1D301 M1D302 M1D303 M1D304 M1D305 M1D306 M1D307 M1D308 M1D309 M1D310 M1D311 M1D312 M1D313 M1D314 M1D315 M1D316 M1D317 M1D318 M1D319 M1D320 M1D321 M1D322 M1D323 M1D324 M1D325 M1D326 M1D327 M1D328 M1D329 M1D330 M1D331 M1D332 M1D333 M1D334 M1D335 M1D336 M1D337 M1D338 M1D339 M1D340 M1D341 M1D342 M1D343 M1D344 M1D345 M1D346 M1D347 M1D348 M1D349 M1D350 M1D351 M1D352 M1D353 M1D354 M1D355 M1D356 M1D357 M1D358 M1D359 M1D360 M1D361 M1D362 M1D363 M1D364 M1D365 M1D366 M1D367 M1D368 M1D369 M1D370 M1D371 M1D372 M1D373 M1D374 M1D375 M1D376 M1D377 M1D378 M1D379 M1D380 M1D381 M1D382 M1D383 M1D384 M1D385 M1D386 M1D387 M1D388 M1D389 M1D390 M1D391 M1D392 M1D393 M1D394 M1D395 M1D396 M1D397 M1D398 M1D399 M1D400 M1D401 M1D402 M1D403 M1D404 M1D405 M1D406 M1D407 M1D408 M1D409 M1D410 M1D411 M1D412 M1D413 M1D414 M1D415 M1D416 M1D417 M1D418 M1D419 M1D420 M1D421 M1D422 M1D423 M1D424 M1D425 M1D426 M1D427 M1D428 M1D429 M1D430 M1D431 M1D432 M1D433 M1D434 M1D435 M1D436 M1D437 M1D438 M1D439 M1D440 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UND1	
MCORXX INTERFACE	
QU27	MCOR 6 8
XU277	MCOR 6 1
YU27	MCOR 6 2
QU28	MCOR 6 3
XU28	MCOR 6 4
YU28	MCOR 6 5
QU29	MCOR 6 6
YU29	MCOR 6 7
QU30	MCOR 6 8
XU30	MCOR 6 9
XU30	MCOR 6 10
YU30	MCOR 6 11
	12
	SPARE
	13
	SPARE
	14
	SPARE

MICRXX INTERFACE	
YOE1	MCOR 12 8
YOE1	MCOR 12 1
YCD3	MCOR 12 2
XC03	MCOR 12 3
YCD0	MCOR 12 4
XC00	MCOR 12 5
	SPARE 6
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	SPARE 9
	SPARE 10
	SPARE 11
	SPARE 12
	SPARE 13
	SPARE 14

UND1	
MCORRX	INTERFACE
QU23	MCOR 6 0
QU23	MCOR 6 1
YU23	MCOR 6 2
QU24	MCOR 6 3
XU24	MCOR 6 4
YU24	MCOR 6 5
QU25	MCOR 6 6
XU25	MCOR 6 7
QU26	MCOR 6 8
XU26	MCOR 6 9
YU26	MCOR 6 10
	MCOR 6 11
	SPARE
	SPARE
	SPARE
	SPARE

[illegible]

MCOR9 INTERFACE	
GUT9	MCOR 60
YCU19	MCOR 6-1
YCU19	MCOR 6-2
GU20	MCOR 6-3
XU20	MCOR 6-4
XU20	MCOR 6-5
GU21	MCOR 6-6
YCU21	MCOR 6-7
YCU21	MCOR 6-8
GU22	MCOR 6-9
YCU22	MCOR 6-10
YCU22	MCOR 6-11
	S/PARE
	S/PARE
	S/PARE
	S/PARE

# Overall Schedule – Cable Plant

## ■ Magnet PS Cable Plant (Phase 4)

### ■ Ponce Rodriguez – This review

- |            |                       |
|------------|-----------------------|
| ■ 01/30/08 | Site Visit            |
| ■ 02/19/08 | Bid Opening           |
| ■ 03/04/08 | Award                 |
| ■ 04/01/08 | Installation Start    |
| ■ 10/31/08 | Installation Complete |

# Overall Schedule – AC Power Installation

## LCLS Facilities – **Khalid Ahmed**

- B005 – 100% done
- B911, B912, B913, B921
  - Initial Design – 100% done
  - Request for Procurements
    - DOE
    - Walk-through – April
    - Award – April/May
    - Estimate \$ 500k
  - Construction starts in May

# Overall Schedule – Related Systems

- LCW Systems
  - Phil Cutino – This review
- Magnet PS Control Systems
  - Kristi Luchini – This review

## Magnet PS Systems – Procurement Status

- Racks – 100% (received)
- Power supplies – 100%
  - 15 intermediate PS to be received by March/08
  - 66 MCORs for UND correctors from PEP
- Intra-rack components – 100% (received)
- Cables : 100% ordered, some received already
- Lugs: 100% ordered, 90% on-hand



## Magnet PS Controls – Procurement Status

- VME Crates – 100% (received and installed)
- VME I/O – 100% (received and installed)
- PLC I/O and Crates – 100% (received, 99% installed)
- MCOR-VME Intra-rack cables – 100% (received, installed)
- Ethernet Intra-rack cables – 100% (received)
- Terminal Server – 100% (received, installed)

# Equipment Status / Rack Readiness – B005

B005-L06			B005-L05			B005-L04			B005-L03			B005-L02			B005-L01		
GROUND BUS	209-958-00	48	GROUND BUS	209-958-00	48	GROUND BUS	209-958-00	48	GROUND BUS	209-958-00	48	GROUND BUS	209-958-00	48			
BLANK	BLANK1	47	BLANK	BLANK1	47	BLANK	BLANK1	47	BLANK	BLANK1	47	BLANK	BLANK1	47			
NEUTRAL BUS	209-959-00	46	NEUTRAL BUS	209-959-00	46	NEUTRAL BUS	209-959-00	46	NEUTRAL BUS	209-959-00	46	NEUTRAL BUS	209-959-00	46			
BLANK	BLANK1	45	BLANK	BLANK1	45	BLANK	BLANK1	45	BLANK	BLANK1	45	BLANK	BLANK1	45			
AC DISTRIBUTION BOX	ACBOX	44	AC DISTRIBUTION BOX	ACBOX	44	AC DISTRIBUTION BOX	ACBOX	44	AC DISTRIBUTION BOX	ACBOX	44	AC DISTRIBUTION BOX	ACBOX	44			
LCLS 480VAC CIRCUIT BREAKER		43	LCLS 480VAC CIRCUIT BREAKER		43	LCLS 480VAC CIRCUIT BREAKER		43	LCLS 480VAC CIRCUIT BREAKER		43	LCLS 208VAC CIRCUIT BREAKER		43	LCLS 208VAC CIRCUIT BREAKER		
		41			41			41			41			41			
		40			40			40			40			40			
		39			39			39			39			39			
		38			38			38			38			38			
BLANK	BLANK1	37	BLANK	BLANK1	37	BLANK	BLANK1	37	DIGITAL PORT SERVER LCLS	DOT/PORT	37	BLANK	BLANK1	37	KICKER PLC		
LCLS MCOOR BULK PS PLC CHV		36	BLANK-2		36	BLANK-2		36	CABLE FEEDTHRU	384-824-00	36	BLANK-2		36			
		35	RESERVED		35	RESERVED	(PAUL BELLOMO) RESERVED	35			35	RESERVED	(PAUL BELLOMO) RESERVED	35			
		34			34			34	LCLS CAT6 PATCH PANEL	LCLS-PATCH	34	CABLE FEEDTHRU	C-FEEDTHRU	34			
		33			33			33			33	LCLS ENET PS CTRL	(Q5) 125-347-11	33			
		32	BLANK	BLANK1	32	BLANK	BLANK1	32	LCLS ENET PS CTRL	(QVM3) 125-347-11	32	LCLS ENET PS CTRL	(Q6) 125-347-11	32	BYKICK KICKER		
CABLE FEEDTHRU	C-FEEDTHRU	31	CABLE FEEDTHRU	C-FEEDTHRU	31	CABLE FEEDTHRU	C-FEEDTHRU	31	CABLE FEEDTHRU	C-FEEDTHRU	31	CABLE FEEDTHRU	C-FEEDTHRU	31			
		30	BLANK-3		30	BLANK-3		30	LCLS ENET PS CTRL	(QVM4) 125-347-11	30	LCLS ENET PS CTRL	(QAD) 125-347-11	30			
		29			29			29	BLANK		29			29			
		28			28			28			28			28			
TRANSDUCTORS (ON SIDE OF		27	TRANSDUCTORS (ON SIDE OF		27	TRANSDUCTORS (ON SIDE OF		27	TRANSDUCTORS (ON SIDE OF		27	TRANSDUCTORS (ON SIDE OF		27	(PAUL BELLOMO) 384-041-10		
		26			26			26			26			26			
		25			25			25			25			25			
		24	BLANK	BLANK-2	24	BLANK	BLANK-2	24			24			24			
		23			23			23			23			23			
HYBRIGCON 2 UNIT MINI CRATE		22			22			22			22			22			
		21			21			21			21			21			
BLOWER		20			20			20			20			20			
		19			19			19			19			19			
		18			18			18			18	GENESYS POWER SUPPLY EN		18			
		17	CABLE FEEDTHRU	C-FEEDTHRU	17			17			17	GEN-PS-ENE		17	GENESYS 50V30A PS (BULK PS BYKICK) GEN50V30		
WIENER 7 SLOT VME 64X		16	WIENER 7 SLOT VME 64X		16			16			16			16			
MINI CRATE-FR		15	MINI CRATE-FR		15			15			15			15			
FOR FUTURE REQUIREMENTS		14	FOR FUTURE REQUIREMENTS		14			14			14			14			
(NOT INSTALLED)		13			13			13			13			13			
		12			12			12			12			12			
BLANK		11	BLANK		11			11			11			11			
ESS POWER SUPPLY 60V/165V		10			10			10			10			10			
		9			9			9			9			9			
		8			8			8			8			8			
		7			7			7			7			7			
		6			6			6			6			6			
S 2 EI-384-131-611 ESS60V165A		5			5			5			5			5			
		4			4			4			4			4			
		3			3			3			3			3			
		2			2			2			2			2			
		1			1			1			1			1			
S 1 EI-384-131-60 ESS60V165A																	

Tue, 2/26/2008

# Equipment Status / Rack Readiness – B912

B912-10	B912-11	B912-12	B912-13
49			49 SPARE RACK: PAUL BELLOMO
48			48
47			47
46			46
45			45
44			44
43	LCLS 480VAC CIRCUIT BREAKER		43
42			42
41			41
40			40
39	CIR/BREAKER		39
38	RESERVED	DIGITAL PORT SERVER LCLS	38
37	BLANK	CABLE FEEDTHRU	37
36	RESERVED	CABLE FEEDTHRU	36
35	LCLS ENET PS CTRL (QUIM1) 125-347-11	LCLS CAT6 PATCH PANEL	35
34	CABLE FEEDTHRU	CABLE FEEDTHRU	34
33	LCLS ENET PS CTRL (QUIM2) 125-347-11		33
32	LCLS ENET PS CTRL (QUIM3) 125-347-11		32
31	CABLE FEEDTHRU		31
30	BLANK		30
29	BLANK-2		29
28	HYBRICON VME CRATE		28
27			27
26	TRANSDUCTORS (ON SIDE OF		26
25	TRANSDUCTORS		25
24	BLANK-3	VME	24
23	CABLE FEEDTHRU		23
22	BLANK		22
21	BLANK-2		21
20	MCOR-12 DRIVER CHASSIS 16		20
19			19
18			18
17			17
16			16
15	(INTERFACE) 236-251-00		15
14	BLOWER		14
13	BLOWER-2		13
12			12
11			11
10			10
9			9
8			8
7			7
6	1 AND S2 QUIM4) COPLEYCRAT		6
5	T.E. POWER SUPPLY 100V150A		5
4			4
3			3
2			2
1	PLY EI-384-043-10) IE100V150A		1

# Equipment Status / Rack Readiness – B913

B913-10		B913-11
BLANK	49	
	48	
	47	
	46	
	45	
5 UNIT	44	
LCLS 480VAC CIRCUIT BREAK	43	LCLS 480VAC CIRCUIT BREAK CIR/BREAKR
	42	
	41	
	40	
CIR/BREAKR	39	
BLANK	38	DIGITAL PORT SERVER LCLS DGT/PORT
BLANK-2	37	CABLE FEEDTHRU 384-824-01
LCLS MCOR BULK PS PLC CHP	36	
	35	
	34	
	33	LCLS CAT6 PATCH PANEL LCLS-PATCH
384-801	32	CABLE FEEDTHRU 384-824-01
CABLE FEEDTHRU 384-824-01	31	
BLANK	30	
2 UNIT	29	
HYBRICON 4UNIT VME	28	
	27	
	26	
	25	
VME	24	
CABLE FEEDTHRU 384-824-01	23	
BLANK	22	
1 UNIT	21	MCOR-12 DRIVER CHASSIS 16CH
MCOR-12 DRIVER CHASSIS 16CH	20	
	19	
	18	
(UND1 INTERFACE) 236-251-00	17	(UND1 INTERFACE) 236-251-00
BLOWER	16	BLOWER
BLOWER-2	15	BLOWER-2
MCOR-12 DRIVER CHASSIS 16CH	14	
	13	MCOR-12 DRIVER CHASSIS 16 (UND1 INTERFACE) 236-251-00
	12	
	11	
	10	
(UND1 INTERFACE) 236-251-00	9	
BLOWER	8	
BLOWER-2	7	BLOWER
ESS POWER SUPPLY 60V/165A	6	BLOWER-2
	5	ESS POWER SUPPLY 60V/165A
	4	
	3	
	2	
(MCOR BULK PS1 E1-384-151-10) ESS60V/165A	1	(MCOR BULK PS2 E1-384-151-20) ESS60V/165A





# Equipment Status / Rack Readiness – B921

B921-10	B921-11	B921-12	B921-13
49	GROUND BUS 209-958-00	49	GROUND BUS 209-958-00
48		48	BLANK 1 UNIT
47	NEUTRAL BUS 209-959-00	47	NEUTRAL BUS 209-959-00
46		46	BLANK 1 UNIT
45	AC DISTRIBUTION BOX	45	AC DISTRIBUTION BOX
44	ACBOX	44	ACBOX
43	LCLS 4-30 CIRCUIT BREAKERS	43	LCLS 4-30 CIRCUIT BREAKERS
42		42	
41		41	
40		40	
39	CIR. BREAKR	39	CIR. BREAKR
38		38	BLANK 2 UNIT
37		37	
36	LCLS MCOR BULK PS PLC CH#	36	LCLS ENET PS CTRL (QUE2) 125-347-11
35		35	CABLE FEEDTHRU
34		34	LCLS ENET PS CTRL (QUE1) 125-347-11
33	(UND1) 384-801	33	CABLE FEEDTHRU
32	CABLE FEEDTHRU	32	HYBRICON VME CRATE (4 U)
31	CABLE FEEDTHRU	31	
30		30	
29	MCOR-12 DRIVER CHASSIS 16	29	LCLS CAT6 PATCH PANEL
28		28	CABLE FEEDTHRU
27		27	TRANSDUCTORS (ON SIDE OF
26		26	
25		25	TRANSDUCTRS
24	(UND1) 236-251-00	24	
23	BLOWER	23	
22	BLOWER-2	22	
21	MCOR-12 DRIVER CHASSIS 16	21	
20		20	
19		19	
18		18	
17	(UND1) 236-251-00	17	
16	BLOWER	16	
15	BLOWER-2	15	
14	MCOR-12 DRIVER CHASSIS 16	14	
13		13	
12		12	
11		11	(QDMP1 AND QDMP2) IE160V93A
10	ESS POWER SUPPLY 80V/165#	10	IE. POWER SUPPLY 80V/125A
9		9	
8	(UND1) 236-251-00	8	
7	BLOWER	7	
6	BLOWER-2	6	(QUE2) IE80V125A
5	ESS POWER SUPPLY 80V/165#	5	IE. POWER SUPPLY 80V/125A
4		4	
3		3	
2		2	
1	MCOR BULK PS 1) ESS80V/165A	1	(QUE1) IE80V125A

# Equipment Status / Rack Readiness B24 Staging Area



# Equipment Status / Rack Readiness – B911



Tue, 2/26/2008

LTU & Dump Installation Readiness Review – Magnet PS

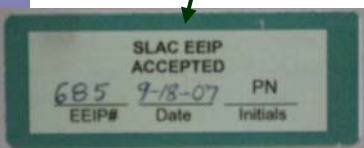
21

Antonio de Lira

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# Equipment Status / Rack Readiness – B912



Tue, 2/26/2008

LTU & Dump Installation Readiness Review – Magnet PS

## Equipment Status / Rack Readiness – B921





# Installation Documentation

- Up-to-date Comprehensive LCLS PS List
  - Inputs:
    - R\_mag, I\_MAX, Z\_mag
  - Outputs:
    - PS requirements, Cable sizing
- Rack profiles – 100%
- CAPTAR – 100%
- Electrical Interconnect (EI) – 100%

# Magnet PS Installation - Safety

- Safety oversight (who's responsible?)
  - Antonio de Lira
  - Clay Corvin - PCD Electrical Safety Officer
  - LCLS
    - Richard M. Boyce – Project Office
    - Jim Turner – Magnet Connection Checkout

# Magnet PS Installation - Safety

- Procedures (which ones are in place?)
  - Initial lockout by LCLS Project Office & PCD
  - Testing procedural
    - To release locks from LCLS Project Office
- Engineering notes & approvals – ESDs
  - Intermediate PS
  - Pulsed systems
- Safety process, reviews and approvals
  - Electrical lock-and-tag procedures (ELP)
- Work authorizations
  - Electrical Work Plan
    - Non-routine work – Hi potting magnets and their cabling

# Magnet PS Installation - Safety

■ Progress/status and control methods for all safety hazards

→ Same model from LCLS injector + BC2 installation

- Initial lockout by LCLS Project Office + PCD
- Procedures by LCLS Project Office + PCD to release power
- Electrical lock-and-tag procedures (ELP)
- Magnet covers
- Magnet cores grounded
- Certification stickers

# Project Staff – Key Personnel

- Magnet PS System Management
  - Antonio de Lira
- PCD Electrical Safety
  - Clay Corvin
- Coordination
  - John Hugyik
  - David Misaki
- PS System Testing
  - Antonio de Lira
  - Briant Lam
  - JJ Lipari
- EPSC & Controls Interface
  - Dave MacNair
- Technical Support
  - Phillip Nguyen
  - PEM Staff
  - PCD Cable Shop
- Cable Plan
  - Ponce Rodriguez
- Controls Integration
  - Kristi Luchini
- Networking
  - Terri Lahey
- Pulsed Systems
  - Tony Beukers
  - John Krzaszczak
- Equipment Inspection (EEIP)
  - Phillip Nguyen
- Magnet - PS Cable Connection
  - Davis-Bacon (Ponce)
  - PCD Cable Shop
- Magnet Mech Installation
  - Carl Rago
  - MFD Staff



## Open Items – Under Design

- 66 MCOR2s for UND correctors
- BCS interface to BX31-36 + BYD1-3 System
- MPS interface to BYKIK

## 2007 Downtime Experience - 😊

- 👍 Lockdown procedures as a good model to secure hazards during installation
- 👍 Pre-testing PS systems in staging area

## 2007 Downtime Experience -

### Magnet - PS connection

- Mismatches: magnet terminals – cable lugs
- No GND-ing points previously assigned
- No covers for magnet terminals

### Mismatch: PS rating – magnet requirements

### Magnets not on-time for connection

### Conflicting schedules

### Network not on-time (including wireless)

### Timing cables not on-time (BXKIK)

# 2007 Downtime Experience - 🤨

## 🐍 Snakes on a Plan

