01-10-92

HYDRANAUTICS DESIGN PROGRAM - VERSION 4.05 (1990) Calculation was made by: NITTO DENKO

Project name : NACL RO SYSTEM SIMURATION

Permeate flow:

29065 GPD

Feedwater temperature : Raw water pH : Acid dosage, ppm(100%): Acidified feed CO2,ppm :

33.0 C 6.50 0.0 H2SO4 0.0

Recovery: 35.0%
Element age: 0.0 years
Flux decline coefficient: 3-yr salt passage increase factor :1.5

Feed Pressure: 749.7 psi

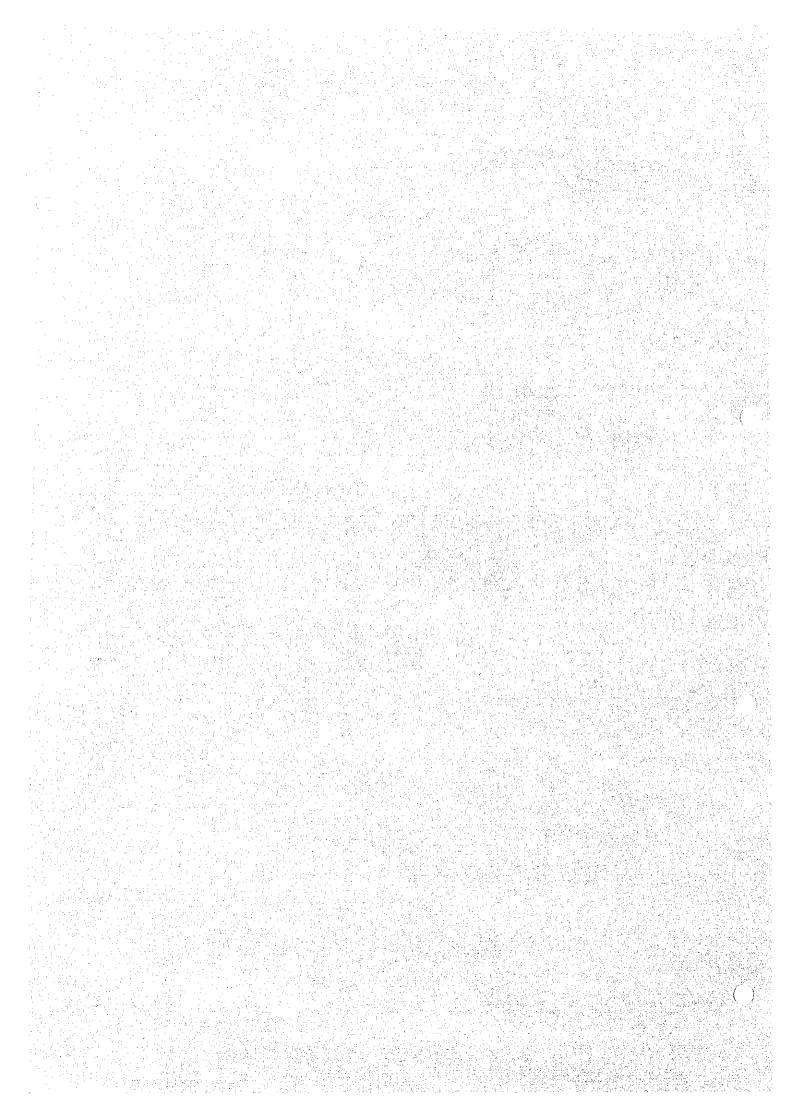
Concentrate Pressure: 716.3 psi

Element Array Feed Flow Total Vessel Conc. Flow Element Beta Conc. Pass Total Vessel Press. Type No. psi gpm gpm gpm mqg 716.3 NTR-759HR-SW8S 6 1x6 37.5 1.03 57.7 37.5 57.7 1

|---Permeate----|--Concentrate--!---Feed water--Raw watermg/lmg/1ppm* mg/lppm* ppm* Ion mg/l0.0 0.0 0.0 0.0 0:0 0.0 0.0 0.0 20913.645464.3 0.0 0.0 Ca -0.0 13760.029913.0 0.0 0.0 0.0 13760.029913.0 llg. 474.8 1032.1 Nă $\overset{\circ}{\overset{\circ}{0}},\overset{\circ}{\overset{\circ}{0}}$ ŏ.ŏ 0.0 İΚ 0.0 0.0 0.0 ŏ.ŏ 0.0 0.0 0.0 0.0 NH4 0.0 ŏ.ŏ 0.0 0.0 0.0 0.0 0.0 0.0 l Ba 0.0 0.0 Sr 0.0 0.0 ō.ŏ 0.0 0.0 CO3 0.0 0.0 0.0 õ.õ 0.0 HCO3 0.0 0.0 0.0 21.240.029957.7 0.0 0.0 21240.029957.7 0.0 0.0 731.8 1032.1 32282.945 0.0 0.0 0.0 0.0 0.0 0.0 0.0 **КОИ** 0.0 0.0 0.0 0.0 Si02 0.0 0.0 53196.5 1206.6 TDS 35000.0 35000.0 рH +/- 10% Notes: *ppm as CaCO3. Calculated concentrations are accurate to

Feed water Concentrate Raw water CaSO4/Ksp*100,% SrSO4/Ksp*100,% BaSO4/Ksp*100,% SiO2 sat.,% Langelier ind. Stiff & Davis ind. Ionic strength 0.0 0.0 ŏ.ŏ 0.0 ŏ.ŏ 0.0 0.00 0.0 0.00 0.00 0.00 0.00 0.96 0.62 0.62425.3 658.8 Osmotic press.,psi

APPENDIX R6-4



	RECO	PRDIN	JG SH	IEET	FOR	R-6	EXPER	I MENT	(, -) D/	ATE 199
TIM	. 1	1 F	EE	D	pН	COOL	ING SYS. MP.(°C)	FEED	7ANK 1P (°C)	CELL	MEI	MBRANE
	MP			S/cmi		IN	ouT	IN	ouŢ	No	N	AME
Cell	TIME	PRESS	BRINE FLUX	time		1	MEAT. EC	E PH	C .)	3	ATED Flux
No		MPa	1/min		Flime	XX Sinle	u S/cm	-	Conc.	Re.	}	m3/m3.day
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	0											
<u> </u>						/ } 7-51				PRD;	91.1	1,22 710
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RECORDING SHEET FOR R-6 EXPERIMENT (7/- 1-1) DATE MOV. 38. 1991

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	TIM	Ë	PRE	SS TEI		カ さ	pН	COOL	yp.(°c)	FEED TEC	TANK 1P.(°C)	CELL	MEMI	BRANE	
	,		MPa	لع ه	. m	S/cmi		١N	047	1 N	ouT	No	NA	ME	
	10 0	74	stor		0 45.	6/460		14.0	16.9	768	24,8	1	2C-	8000	
230	10:	! !	S. 6.	26.	0 46.8	46.0		160	19.7	26.1	25.9	3			
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لد		1/2	:00	80)	20		20.11	8-1-	1500	22.	851			0.688	
i								/ ·	/21.4		AV	⊼V-		اب ا	5.831
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			F	1445	1.86x	scale t	5 (4	d) ,	Fluxical	JF Flux	(p) x 3.4	127 x 10	(4	"/m' day	j

RECORDING SHEET FOR R-6 EXPERIMENT (7/- 2-2) DATE MOVILY 1991

E PRESS TEMP EC PH TEMP. (°C) TEMP. (°C) CELL MEMBRANE

MPa °C. MS/cmi - IN OUT IN OUT NO NAME

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DATE Nov. 24. 199/ RECORDING SHEET FOR R-6 EXPERIMENT (TI-2-3) CELL MEMBRANE TEMP (°C) TEMP. (°C) PH No NAME m S/cm OUT OUT IN IN MPa 2C-8000 10:33 800 7 5 8 CALCULATED BRINE MEATE 7 E TIME PRESS Ed time Rei Flux PH Conc. Flux 1/min MPa m3/m3.dey min u S/cm mg/e ml/scale 7.6 10.10 Soo 2.0 0 0 835 za5/ 6 30 0.70 20 1,8

No

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	9	/, ; ,0	200	2.3	D	/	(000)	7 <u>.6</u>				
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	(ell	+	IME	PRES	S B!	LUX	tim	e F	PE lux		<i>ЕАТ</i> ЕС	PH	Conc.	·Re		ATED Flux	4
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			c •						1		and the second s		964	. 96	.78	AV 0,66	0,60
7	7.5													PRD;	91.1	1,22	ス <u>.</u>
			÷							7-5	55						
										÷	· · · ·						

DATE RECORDING SHEET FOR R-6 EXPERIMENT (PI-1-1) 27. Nov. 1991 COOLING SYS. FE FEED TANK E D CELL MEMBRANE TIME PRESS TEMP.(°C) TEMP (C) EMP pH No NAME MS/cmi IN OUT ΙN oat et. MPa TTC-80HR 10:20 start (Totay) (124008) (48,2,25°C) 15°C 140 46.3 180 25,0 25,2 TTC80HF Ž (46.8,25°C) (" 800 29. 6.6 490 10.0 280 27.5 (47,2,25x) 42.5 25.4 J5.5 25.2 150 800 TTC70 (47.6 25.4)6.6 15.8 16.0 18.8 25.4 800 25.4 C 4 147.4 13:45 26.6 w. 21,5 26.6 27. BRINE CALCULATED E PE MEAT **PRESS** TIME FLUX time Ed Rei Flux PH Conc. Flux MPa 1/min u S/cm No MIM me /scale m13/2 m3/m2 day 23.0) 3,660 21,2/8.7 1800 1.6 93.3 3.830 131-2020 NGE) MEMBRAN CHA 132'51 (23,0) 2400 125/40" 20,3/8,2 2500 0.99 1300 (23.9) 2220 2=10'08 30 (₹4 / 1182 1.03 2280 30 / 800 110/ 100 /ه اد 1.6 2170 9602 102 0.93. 1194 1331 970 23.0/9.7 1.37 508 98.3/ 18"00 (23.0) 921 1.3. _2 30 43 22.6/11.1 961 1.30 484 902 (23.9) 910 30' 38./ 1.30 420 935 8-00751 38 / 465 116 30 926 130 AV 482 ÄΫ 1.2/ 98.39 7.37. 189ml (22.9) 33.20 25.1/10.8 8.45 3 121,400 1.6 34600 192ml 15.6/1/ 10:43 805 6.58 14.5/10,5 22.7 3440 1:1623 271 36200 22500 7.27 (3.9).3£7. <u> シン・1/--</u> 351 2.5.7 22900 16700 200 2241 3 .45 35800 7.68 AV 301 22.200 22250 EC (1800) No 19 = (EC+519) PRD; 91.11,22 -(EC>17000) Flux = 1.86 x scale +5 (ml) Flux (m)/m2 day) = Flux (p) x7.427x10 Rij = (1- 1/200) X(00)

RECORDING SHEET FOR R-6 EXPERIMENT (P1-1-2) DATE 27.Nov. 1991

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	No			Mf	a	1/min	min	\ me	·/scalc		u S/cm		mg/e	%		m3/m3.day	<u> </u>
-	4		•			/ 6	30/6		3/77	·	1) 2,050 2,120 2) 22/0 2320		1,096			0.66	
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RECORDING SHEET FOR R-6 EXPERIMENT (PI- 1-3) DATE 27 NIV. 1991

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	American de la companya de la compan													9	(C-80HF		
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No	<u> </u>		٢	1Pa	1/mi		41	me/	scale		i S/com		mg/l	%		m3/m3.day	1	
1					1.6.	(15.92) 15 1-27	⊭	25.01	,	(23.	1,180		624			1.61		
					לייויים פ	300)3 ^ [26.21 451	,	624	156 .0) 928 940		4.5/ 4.73			1.52		
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-		•				- 1	_ 1	22.31 59:1	, 	(23.	9)2,790		1759			0.99		
1	J	13.81	-			30	1	27.1	· · · · · · · · · · · · · · · · · · ·	1	1860 1780		1494	AV		0.92		
		•					-		/	<u></u>			1473	95. PRD:	09 191.1	0.96 1,22 - male	0.22.	
Par.			——							7-	58		· · · · · · · · · · · · · · · · · · ·			· · · · · · · · · · · · · · · · · · ·	<u></u>	
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		RE	0	RDIN	JG SH	EET	FOR	R-l	6 EXPER	MENT	(PI-	1-4) <u>각</u>	ATE 7 N.V. 199	1
	TIM	F P	RES		5 A	2	рН	ILVVI	ING SYS. EMP.(°C)	1	TANK 1P.(°C)	والمسلما	MEI	MBRANE	
			1Pa			S/cmi		IN	1	IN	ouT	No		AME	
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	:				DRIAIT		r -	Dr.	MEAT	<u> </u>		CAL	CUL	ATED	
	Cell	TIM	F	PRESS	BRINE FLUX	time	Flu		EC	PH	Conc.	Re		Flux	
().	No	1.:		MPa	l/min	min	me/		M S/cm	-	mg/l	%	3 -	m3/m2 day	
`	10	10:0	27		1.6	11/23"	35.41		20900		12.500			3,20	
		10	57		(9.8) / .6	1:20'28"	33.5	/	22200		13.300			3.5/	
•		•				301	1	/	23.8)22800 23.400		14,000	 		3.50	
• •	/ -	13:4	15-			} 0	100/		23/00		13.800			3,43	
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		•				., ,		/			13,400	AV 55	.33	AV 3,41	3.13
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	<i> </i>	•			1:10'40_	1:35 110	240/	いり	=1.788/ (23.0) 1394		743			1.01	
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()				ام ساید و ایمانیان حداثات اسالات		30'	0/	21	2070		1269_			0.99	
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RECORDING SHEET FOR R-6 EXPERIMENT (P2-1-1) COOLING SYS. FEED TANK ED CELL TIME MEMBRANE PRESS TEMP(°C) TEMP TEMP.(°C) PH MS/cmi NAME No OUT out ٠ لغ٩ IN LN MPa W Start 24.5 TTC-80HR 15P 7.0 (100) 9°C 24,5 20,8 Sooks 48.0 25.0 25.5 UTC-80HF 19.8 2 11.4 25,3 6.4 15,5 47.0 25,5 800P3/ 26,2 UTC-70 26.6 ઝ SP 15.5 19.0 47.1 6.5 26.0 800751 56-8000 26,6 ŚP 26.5 4 16,0 6.5 19.0 47,2 15.0 NTR-759HR 800 248 6.55 24.7 6 20,0 26,0 47.4 16.5 800 361 200 27.0 13:50 220 6.57 16.0 422 CALCULATED BRINE りど MEAT E PRESS TIME time Rei Flux Ed PH Conc. Flux MPa 1/min me /scale m3/m2 day %. No min mg/e m S/cm 800 PS 1-11:45 19 / 1.055 30 16. 12 315 12/ 1,2/6 1.6 72/ રુ 7.700 1.6. 20 / 1.473 1.6. 42/ 1.6. 1.15/ 16. 36/ ځږ 1008 1.6. فخ * ؟ Sm2. 641 1236 <u>.</u> <u>.</u> 841 7540 23/ 4 1.130 50/ 1.136 / 12,50 311 30 987 16 50 13.50 547 1280 73 / 7410 181 1540 4 43/ 6 1.080

7-60

PRD; 91.11,22-miles

RECORDING SHEET FOR R-6 EXPERIMENT (P2-1-2) DATE 199 F É TEMP. COOL ING SYS, FEED TANK TEMP (°C) CELL PRESS MEMBRANE DH TEMP (°C) NAME No m S/cm . ريمه IN OUT LN OUT MPa NTR75950 Start Ref: P2-1-1 2 800851 UTC-80HR SP R UTC-80HF UTC-70 SP 10 NTR759 500 SP 11 NTR 75914R SP MEAT E BRINE CALCULATED アモ PRESS TIME time EG Rei PH Flux Flux Conc. 1/min mg/e MPa $(\dot{})$ No min . M. S/cm % m3/m3.day me /scale 800/3/ 3// 1539 30 .45 1.6 947 28 / 1.6 38/ 877 1.6 7/1 6950 1.6 10 28.5/ 1937. 1.6 39,57 11.75 /2 1.6 12 15 37/ 1466 35 1,6 850 2.10 33/ 884 46/ 835 847 6.640 12 33 / 1840 461 1140 12 32/ 1,380 30 6.2/ 800 16 2 28/ 8 .85/ 38 / 818 6,500 701 70 78/ 1780 1101 12 . spreaded silicent LUBRICANT without No7. PRD; 91.11,22 SP: Added Spacer

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Tu	ME	PRE		FE	Æ .		pΗ	_(00	611	/& SYS. P.(°C)	PHEV	TANK 1P.(°C)	N-0-1 1	ME	MBRANE]
		1194		£.		S/cmi		IN		out	IN	OUT	No		AME	
					P2-	- (-))						1 2 3 % 5	บา 52	-8000 -8000	
													6789011	TT.	-7591-1R 1, SW C-80HR 1, HF C-170 R-7595W	
		<u> </u>	<u> </u>	lo	RINE			PE	- M	EAT	E		CAL		ATED	
(el	<u> </u>	IME	PRES)3 T	ELUX	tim		lux	1	E C	рН	Conc.	-Re	<u>) </u>	Flux]
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7-62 -

DATE 3. De 1991 RECORDING SHEET FOR R-6 EXPERIMENT (P3-1-1) F E TEMP COOLING SYS. FEED TANK ED CELL MEMBRANE PRESS TIME TEMP (°C) TEMP.(°C) PH NAME No m S/cm راج out OUT IN LN MPa (J) 9.50 D7C-20HR 1 53.1 6.56 140 120 23.8 23.8 801 151 240 800151 UTC 80HF 25,5 53.0 الحري ه 8-2.8 15.0 19.5 25.4 25,4 2 21,0 53.1 16.0 6.59 19.5 25,0 25.2 TTC 70 3 800 26.5 .50 16.5 6.61 26.3 53.1 260 19.8 4 26,5 26.7 19.0 12 .20 120 6.62 57.1 11.7 000 5 12.545 295 6.63 53.1 22.3 245 28.1 29.0 30.5 240 6 13 05 31,8 33.5 285 53.1 6.63 33.0 BRINE CALCULATED PE MEAT E PRESS Cell TIME FLUX time Εç Flux Rei PH Flux Conc. 1/min u S/cm No MPa MIM ml /scale mg/e m3/m2.day 800 30 16 10.20 25/ 1016 929 26.51 10:50 27.0/ 999 :20 800 30 1.6 19680 5// 2 10:20 515/ 20200 10:50 :20 53./ 19930 30 20 B 631 1/190 PRD; 91.11,22-miles

7 - 63

RECORDING SHEET FOR R-6 EXPERIMENT (P3-1-2) DATE 3 Dec. 1991

	RECO	ノドレハ		EE1	1 417		CVLCI		-C 4 . 4)	' بن	40.5.00		1
TIM	E PRE	SS TEN			pH	COOL!	NG SYS. 1P.(°C)	TEL	TANK IP (°C)	CELL	MEMB	RANE	
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int a line languar spinings of	11:20	. 430 ma	and due tee		36/		1140		<u>-</u> -	(****			
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RECORDING SHEET FOR R-6 EXPERIMENT (P3-1-3) DATE 3. Dec 1991

	TIM	T nor	cc F	EE			COOL	ING SYS.	FEED	TANK	4711	Mr	MBRANE	
~ <i>⊴⊈</i> °′ ,	MIT]	<u>c</u>	рH	Į	MP.(°C)	TEN	1 P (°C)	1	1		1
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	• -										10	דע	C-70	
	,													
	•											_	1	
,	Cell	TIME	PRESS	BRINE	time			MEAT		_	1		ATED	
	No		MPa	1/min		TIU	LX COOL	EC uS/cm	pH -	Conc.	Re.	<u>ì </u>	Flux m3/m2.day	
	8	10:20	300	1.6	30	24		848					/m ·way	
				100			1				-			[
	-	10:50				23 /		834						
		11.20				24 /		8/8						
		11:50		4.0	30	25,5		750		:			·	
		12:20				280	/	776						ļ
		12:50			15	16.51	/	763	6.65					
	9	10:20	800	1.6	30	311	/	928						
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RECORDING SHEET FOR R-6 EXPERIMENT (P3-1-4) DATE 3.00 1991

		F	EE	D		COOL	ING SYS. MP.(°C)	FEED	TANK	4-11	MT	MBRANE]
TIM	E PRE	SS TEN	IP. E	<u> </u>	рH	TE	MP.(°C)	TEN	1P.(°C)	ł .			
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		REC	DRD	NG	SH	EET	FOR	R-	6 EXPE	ZI MENT	(M-	1-1) 2	ATE C. 8. 199	<u>/</u>
		PRE	1 7	HP]	E	D i	рH	C00	LING SYS	FEEL	TANK	CELL	ME	MBRANE	
	11111			. رہے رہے		S/cmi	- 	IN		IN	OUT	No	ı	AME	
56 Mg/m	9.2	MPG											-	R739HR	
197PS1)	9.5	5.5	1 '	λ*		(3	6.51	127.		ı	26.0		Ì	R159HR	
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5 % (m² 15 PSI)	11:3	6.4	2%	7,0	ځ.	; ;;;	6.45			26,8	27,5				!
13 (18) 4 MPA	1 . :		27	7,0	53	.3	6.47	18	1-	27.0				-	
7.010			V												
	(ell	TIME	PRES	S BR	INE	tim			MEAT EC	F PH	r	1		ATED Flux	
e)	No		MPa		min		<u> </u>	ux Iscale	u S/cm	-	Conc.	Re		m3/m2.day	
		9:50	5.5	4	,O	20	28	· ····	2.460					<i>f</i>	
	/ -	10:10	}		\	,	29	_	2.350				:		
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	TIM	: 1	PRES	IF	E E	р С	рН	COOL	_ { } \	JG SYS.	FEED	TANK IP.(°C)	CELL	ME	MBRANE	
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، حــــــــــــــــــــــــــــــــــــ		П	-5:5	27:		زي	;-3	-6	.17	1-1-		19-8-	-26,2	-27-0-	3		,_00	 - .
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RECORDING SHEET FOR R-6 EXPERIMENT (M-5-1) DIC. 14. 199 F E TEMP ED COOLING SYS. FEEDTANK CELL MEMBRAHE TIME PRESS EC. TEMP, (°C) TEMP.(°C) pН No NAME m S/cmi لج^ه IN OUT FN OUT MPa TTC-80HR 17.5 6.49 145 25.4 25.9 9:50 5,5 25.5 53.8 HA 2 10:20 19.5 53,9 1500 25,0 247 5.5 25,0 6.51 CH 1178759 HR ડ 19.5 16.0 0.50 25.5 255 53.9 6.5-2 25,3 70 53) 6.4 CH: Change Memis. 6.5-3 16.0 253 549 6.4 25.3 26,0 1.20 16.0 19.0 26,0 6.54 54.0 250 248 6.4 1:50 17.0 19.7 25.7 0.54 53.7 26.0 80.0 C 5,5 20 17.0 5.5 16 6.55 25.8 02.50 CALCULATED BRINE PE MEAT 7 TIME | PRESS (ell FLUX time PH EC Rei Flux Conc. Flux MPa 1/min mi /mi day MIN mg/p 2/5 mil /scale No M S/cm 1.6 9:50 22 Q 30 27/ 397 10:20 27 / 436 1, 0 6.4 4}5/ 370 10:50 6.35 350 1, 34/ 1.6 1.4 مرز 9 5,5 4.0 27.7 358 11:50 376 171 12:20 1, 1 30 33/ 685 3.5 1.6 2 9:50 702 1, 32/ 1-11 10:20 • () 10:50 1 634 42/ 6.4 0 640 624 41/ 1 11:20 60/ 5,5 40 341 .50 597 34/. 12:30 30 34.51 1402 ्र 3 :20 5.5 1.6 1 1448 34/ 10:20 1220 441 10:35 1.4 1,2 1164 4 43/ 11 :20 11

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RECORDING SHEET FOR R-6 EXPERIMENT (M-5-2) BATE 199

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RECORDING SHEET FOR R-6 EXPERIMENT (M-5-3) DATE 199

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RECORDING SHEET FOR R-6 EXPERIMENT (M-5-4) DATE 199

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RECORDING SHEET FOR R-6 EXPERIMENT (M-5-6) DATE 199

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RECORDING SHEET FOR R-6 EXPERIMENT (4-6-1) DATE 1991

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RECORDING SHEET FOR R-6 EXPERIMENT (4-6-2) DATE 1991

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			SE CO	ρR	DIN	JG St	IEET	FOR	R-	6	EXPER	I MENT	44-6	-4) <u>p</u>	ATE (C.16, 199)
	TIM	. 1	PRE	1	F	EE	D	p <i>I</i> -l	COOL	Li	vg sys, 12,(°c)	TEED TEA	TANK 1P.(°C)	CELL	•	MBRANE	}
:	•	-	MPa		عه.		S/cm		IN	.]	ouT	IN	out	No	J	AME	1
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ì	Cell	T	IME	PR	ESS	BRINE	time				EAT EC	E pH	Conc.	Re		ATED Flux	1
		• •	•	}	Pa	1/min	min	Flime	Scale		u S/cm		mg/l	%		m3/m2.day	
1	10	9	:15	4	.,9	1.6	30	32 ,	/	:	3 450				- -		}-
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RECORDING SHEET FOR R-6 EXPERIMENT (M-7-1) DATE 1991

		. 1	, E CV	スレロ	4 Y	1166	1 01	' '	O TVI CL			·			
	TIM	E	PRES	SS TEI		5 D	DН	C00	LING SYS. EMP.(°C)	FEED	7 TANK 1 P.(°C)	CELL	ME	MBRANE	
			MPa			11 S/cmi		IN	İ	IN	ouT	No		AME	
start 12100	/2:3	λ.	5.5	-		ニ クン	6.40			26.8	26.5	1	77	C-80HR	1
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	(ell	T	ME	PRESS	FLUX	tim	e F	lux	EC	pH	Conci	Re		Flux	
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RECORDING SHEET FOR R-6 EXPERIMENT (4-7-2) DATE 199

	1			F		D	1 414	COOL.	ING SYS.	FEED	TANK				1
	TIM	<u>E</u> PR	ESS	TEA			рH	TE	MP.(°C)	TEL	1 <u>P.(°c)</u>	CELL	MEI	MBRANE	, 1
		IIM	Pa	oe.	m	S/cmi		IN	out	IN	ouT	No	N	AME	
	•											2	NT.	R7595W	
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	Cell	TIMI	- PR	RESS	BRINE			PFŖI	TEAT.			,		ATED	}
	1			1Pa	FLUX	time	<u> </u>		EG	PH	Conc.	Re.		Flux	-
į	No		-		l/min	1	me/		u S/cm_		mg/l	%	-	m3/m2.day	_
İ	?	12:30	. 3	5	1.6	30	32,		534		<u> </u>				
i		13:10) 6	(14	. 4	.11	381		470		 				
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RECORDING SHEET_FOR R-6 EXPERIMENT 49-8-1) DATE 198/

	<u> </u>	- 11				1 ~ .								- (
	TIM	E	PRE	SS TE	HP.	E	ァ <u> </u>) H	COOL	レル	VG SYS. 1P.(°C)	FEED TEC	TANK 1P(°C)	CELL	ME	MBRANT	E
Start			MPa	0	٠ ري	m	S/cm			IN		out	IN	ouT	No	•	AME	
11:10			人生		. 6	2	.96	6	56	15.	0	2/.0	25.2	25./	1	ויט	c 70	
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))	No	Ť.		MPa		-/min	ļ		Flume.	scale		EC uS/cm	рН 	Conc.	Re.		Flux m3/m2.	
1	1	11	`40	1.5	/	1.6	30		46.5			106						7
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•	2	11	.40	1.5		1.6	30		43/	/ .	2	07						
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		<i>.</i> ≈	?.						/	,								
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RECORDING SHEET FOR R-6 EXPERIMENT (Y-8-2) DATE 1981

	TIM		PRE	SS TEN	EE	D C	рH	COOL	ING SYS. MP.(°C)	FEED	TANK	CELL	MEMBRANE	7
	•		MPa			S/cmi	<u> </u>	١N	ouT	IN	ouT	No	NAME	
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Ì	Cell	T	IME	PRESS	BRINE	time			MEAT.	E PH	r .	1	CULATED i Flux	_
	No	Ï	*	MPa	1/min	min	Flume	scale	EC u S/cm	-	Conc.	Re.		<u>-</u>
	7	//	40	1.5	1.6	30	40,		156					
	,	1	. 10	4		11	4/5/	7	150					
	• - :	13					TES.	/				 		
	8	11	40	1.5"	1.6	30	44 1	/	165					
-		/2	10	4	11	4	45/	/-	154	,				
			•				/	/						
1	9	11	:40	1.5	1.6	30	186	′	15-2					
` .	/ - ·	ز إ	2./0	"	"	0	39/		144					. .
		/3	:00	1.5	40	3/	40/	,	112					
	ΙP.	11.	40	15	1.6	30	73.7		169-		: '			·
		2	.10	"	۶	5	44/		162					
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	12	11	:40	1,5	1.6	ه در	421		134	····				
		2	.10	11	"	4	42.57	,	126				<u> </u>	
-	-	73	.00	- 1/2	40-	3/	421	/	700					• =
		13	:30	11	1	.39	41.0							
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RECORDING SHEET FOR R-6 EXPERIMENT (4-8-3) DATE DOC. 17. 1991

TIME PRESS TEMP EC PH TEMP(°C) TEMP(°C) (ELL MEMBRANE)

	MIT	E	PRE	55 T	EMP.	E	c	p	H	TI	. 12 5M	p.(°C)	TEN	17.(°C)	CELL	MEN	1BRANE	
			MPa		. ہے	İ	S/cmi			IN	ļ	ouT	1 N	ouT	No		AME	
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	Į .	Ţ	IME	PRES		LUX	time	-1	Flu	ιχ	E	Ç	рН	Conc.	Re.	<u>i </u>	Flux	
	No	1		MP		/min	M14		me/	scale		i S/cm		mg/e	%		m3/m2.do	¥_
(5)	1	įз	30	۸5	4	(, 0	30	ļ	45	Į.		2.4						
C)		14	1.70	7,5	- \$	2.0	 		325	/	7	4.2						
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Q	3	3	:}0	1.5	- 4	4.0	30		37,5%		9	8,0						
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<u>V</u>	\$	/3	:30	4.5	4	<u></u>	٥٤		38 /	 		¥.2.¥.	,					
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M9112YY
                   RESULT OF EXPERIMENT (MAIN
                                                      FEED
                    FEED
                                    CELS FLUX
                                                 EC
                                                     FLOW CONC
                                                                  REJ
                    CONC PRESSTEMP
         MEMBLENE
 DATANO
         NTR759HR 30573
                                                 527 1.6
                                                            259 99.15 1.628 Q
                          6.5 25.5
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911216B
                                                            268 99.12 1.643
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 911208
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                                                 2040 4.0
                                                          1,053 97.00 1.338
                           5.5
                              26.0
                                     2
 911208
         NTR759HR 35076
                                       * 29.0
                                                          1,219 96.52 1.362
                                                2350 4.0
                                     1
 911208
         NTR759HR 35076
                           5.5
                              26.0
                                                2380 4.0 1,235 96.48 1.315
                                         28.0
 911208
         NTR759HR 35076
                           5.5 26.0
                                     - 1
                                       *
                                                 2460 4.0 1,278 96.36 1.315
                                         28.0
                           5.5 27.0
                                     *
 911208
         NTR759HR 35076
                                                            366 98.97 1.189 C
                                                 736 1.6
         NTR759HR 35589
                           5,9 25.0
                                     6
                                       * 38.0
911216A
                                                            371 98.96 1.221
                                                 745 1.6
         NTR759HR 35589
                                     6
                                       *
                                         39.0
                           5.9 25.0
911216A
                                                            600 98.31 1.268
                                         40.5
                                                1185 1.6
         NTR759HR 35589
                           5.9 25.0
                                     3
                                       *
911216A
                                                            603 98.31 1.252
                                         40.0
                                                 1190 1.6
         NTR759HR 35589
                           5.9 25.0
                                     3
                                       *
911216A
                                                            351 99.01 1.409
         NTR759HR 35547
                           6.4
                                 26
                                     6
                                       *
                                         45.0
                                                 707 1.6
911214A
                                                            361 98.98 1.409
                           6.4
                               25.5
                                     6
                                       *
                                         45.0
                                                 726 1.6.
911214A
         NTR759HR 35547
                                         45.0
                                                 1090-1.6
                                                            550 98.43 1.409
                                 26
                                    12
                                       *
 911209
         NTR759HR
                  35060
                           6.4
                                                            589 98.34 1.346
                                     3
                                       *
                                         43.0
                                                 1164 1.6
         NTR759HR
                   35547
                           6.4
                                 26
911214A
                                                            618 98.26 1.377
                                     3
                                       * 44.0
                                                 1220 1.6
                               25.5
         NTR759HR
                   35547
                           6.4
911214A
                                                            645 98.16 1.573
                                 26
                                         50.3
                                                 1270 1.6
                                     8
                                       *
         NTR759HR
                   35060
                           6.4
 911209
                                                         1,095 96.92 1.440
                                       *
                                         46.0
                                                2120 1.6
                                 26
                                    12
911214A
         NTR759HR
                   35547
                           6.4
                                                2260 1.6 1.170 96.71 1.471
                               25.5
                                    12
                                       *
                                         47.0
                   35547
                           6.4
911214A
         NTR759HR
                                                2360 1.6 1,224 96.51 1.362
                                 26
                                    10
                                       *
                                         43.5
         NTR759HR 35060
911209
                          6.4
```

M9112YY RESULT OF EXPERIMENT (MAIN FEED FEED DATANO MEMBLENE CONC PRESSTEMP CELS FLUX EC FLOW CONC REJ FLUX NTR759HR 35547 27 6 * 49.0592 4.0 292 99.18 1.534 \$ 9112148 6.4NTR759HR 35076 6.4 27.0 2 * 36.41710 4.0 877 97.50 1.709 911208 NTR759HR 35076 6.4 27.0 1770 4.0 909 97.41 1.690 911208 2 * 36.0 NTR759HR 35076 6.4 27.0 2030 4.0 1.047 97.02 1.709 .1 * 36.4 911208 6.4 27.0 2080 4.0 1,074 96.94 1.690 NTR759HR 35076 1 * 36.0 911208 911211B NTR759HR 40984 6.4 28.0 6 * 39.0820 4.0 410 99.00 1.221 NTR759HR 41018 5.5 24.8 6 * 28.01090 1.6 550 98.66 0.876 O 911211A NTR759HR 41018 2.5 6 * 27.5 1090 1.6 550 98.66 0.861 911211A 5.5 NTR759HR 41018 : 26 6 * 27.0 1090 1.6 550 98.66 0.845 911211A 5.5 26 12 * 29.0 3390 1.6 1,780 95.66 0.908 NTR759HR 41018 911211A 5.5 5.5 24.8 12 * 28.0 3520 1.6 1.851 95.49 0.876 NTR759HR 41018 911211A 25 12 * 28.0 3580 1.6 1,884 95.41 0.876 NTR759HR 41018 911211A 5.53730 1.6 1.965 95.21 0.751 3850 1.6 2.031 95.05 0.939 3950 1.6 2.086 94.91 0.939 25 10 * 24.0 NTR759HR 41018 911211A 5.5 $5.5\ 24.8\ 10 * 30.0$ NTR759HR 41018 911211A 26 10 * 30.0 NTR759HR 41018 911211A 5.5 446 98.91 1.127 0 26.6 * 36.0890 1.6 911211A NTR759HR 41018 6.4 446 98.91 1.111 6 * 35.5 890 1.6 911211A NTR759HR 41018 8.4 25 534 1.6 NTR759SW 30573 5.5 27.0 263 99.14 1.002 7 * 32.0 911216B 740 1.6 368 98.80 1.096 470 1.6 230 99.25 1.189 0 676 1.6 5.5 27.0 11 * 33.0 NTR759SW 30573 911216B 911216B NTR759SW 30573 5.5 27.0 4 * 35.07 * 38.0 911216B NTR759SW 30573 6.5 25.5 NTR759SW 30573 6.5 26.0 7 * 39.0911216B NTR759SW 30573 6.5 25.5 11 * 39.0 603 1.6 298 99.03 1.221 911216B 6.5 26.0 11 * 40.0604 1.6 299 99.02 1.252 911216B NTR759SW 30573 6.5 25.5 4 * 42.0 669 1.6 332 98.91 1.315 911216B NTR759SW 30573 6.5 26.0 671 1.6 333 98.91 1.346 NTR759SW 30573 4 * 43.0911216B 948 1.6 476 98.66 0.626 O 4.9 26.0 NTR759SW 35589 7 * 20.0 911216A 500 98.60 0.689 NTR759SW 35589 4.9 25.0 11 * 22.0 994 1.6 911216A 4,9 25.0 7 * 21.0 1000 1.6 503 98.59 0.657 NTR759SW 35589 911216A 1013 1.6 510 98.57 0.657 NTR759SW 35589 4.9 26.0 11 * 21.0 911216A 540 98.48 0.689 911216A NTR759SW 35589 4.9 25.0 4 * 22.0 1070 1.6 557 98.43 0.657 911216A NTR759SW 35589 4.9 26.0 4 * 21.0 1102 1.6 451 98.73 0.861 911214A NTR759SW 35547 5.5 25.5 4 * 27.5900 1.6 911214A NTR759SW 35547 5.5 25 4 * 27.0931-1.6 467 98.69 0.845 NTR759SW 35547 25 11 * 25.0 1260 1.6 639 98.20 0.783 911214A 5.5 $5.5\ 25.5\ 11\ *\ 24.5$ 1330 1.6 676 98.10 0.767 911214A NTR759SW 35547 911214A NTR759SW 35547 5.5 25 7 * 26.0 2780 1.6 1,450 95.92 0.814 911214A NTR759SW 35547 5.5 25.5 7 * 25.0 2990 1.6 1,564 95.60 0.783 26 4 * 29.0 862 4.0 432 98.78 0.908 911214A NTR759SW 35547 5.5 5.5 26 4 * 28.0 880 4.0 441 98.76 0.876 NTR759SW 35547 911214A 5.5 26.0 6 * 18.2 2080 4.0 1,074 96.94 0.854 NTR759SW 35076 911208 2080 4.0 1.074 96.94 0.845 NTR759SW 35076 5.5 26.0 6 * 18.0911208 2110 4.0 1.090 96.89 0.869 NTR759SW 35076 5.5 27.0 6 * 18.5 911208 3 * 18.5 3 * 18.7 2960 4.0 1.547 95.59 0.869 911208 NTR759SW 35076 5.5 26.0 3010 4.0 1.574 95.51 0.878 NTR759SW 35076 5.5 26.0 911208 $5.5 \ 27.0 \ 3 * 18.5$ 911208 NTR759SW 35076 3220 4.0 1,688 95.19 0.869 5.9 25.0 7 * 29.0 708 1.6 352 99.01 0.908 O NTR759SW 35589 911216A NTR759SW 35589 5.9 25.0 7 * 28.5 743 1.6 370 98.96 0.892 911216A 5.9 25.0 11 * 29.0 860 1.6 5.9 25.0 11 * 29.5 863 1.6 5.9 25.0 4 * 31.0 917 1.6 431 98.79 0.908 NTR759SW 35589 911216A 432 98.79 0.923 NTR759SW 35589 911216A

NTR759SW 35589

911216A

460 98.71 0.970

```
M9112YY
                   RESULT OF EXPERIMENT (MAIN
                                                  )
                                                      FEED
                    FEED
                                                                  REJ
                                                                        FLUX
                          PRESSTEMP CELS FLUX
                                                  EC:
                                                      FLOW CONC
                    CONC
 DATANO
         MEMBLENE
                                                            459 98.71 0.955
                                      4 * 30.5
         NTR759SW 35589
                                                  915 1.6
                           5.9 25.0
911216A
                                                             438 98.77 1.127
                                          36.0
                                                  875 1.6
                           6.4 25.5
                                      4
                                        *
911214A
         NTR759SW
                   35547
                                                             437 98.77 1.096
                                                  872 1.6
                                 26
                                        *.
                                          35.0
9112141
         NTR759SW
                   35547
                           6.4
                                      4
                                                            493 98.61 1.002
         NTR759SW
                   35547
                           6.4
                                  26
                                    11
                                        *
                                          32.0
                                                  981 1.6
911214A
                                                 1056 1.6
                                                            533
                                                                98.50 1.002
         NTR759SW
                   35547
                           6.4 25.5
                                     11 *
                                          32.0
911214A
                                                          1.192
                                                                 96.65 1.002
                                                 2300 1.6
                   35547
                                 26
                                      7
                                        *
                                          32.0
911214A
         NTR759SW
                           6.4
                                                          1,278
                                                                 96.40 1.033
                                                 2460 1.6
         NTR759SW 35547
                           6.4 25.5
                                      7
                                        *
                                          33.0
911214A
                                                            379 98.93 1.221
                                                  760 4.0
                                      4 *
                                          39.0
         NTR759SW 35547
                           6.4
                                27
911214A
                                                            941 97.32 1.127
                                                 1830 4.0
                                      6 * 24.0
         NTR759SW 35076
                           6.4 27.0
 911208
                                                 1870 4.0
                                                            962 97.26 1.080
                                      6 * 23.0
         NTR759SW 35076
                           6.4 27.0
 911208
                                                             729 98.22 0.689 O
                                                 1430 1.6
         NTR759SW 41018
                           5.5 24.8
                                      4 * 22.0
911211A
                                                 1460 1.6
                                                            745 98.18 0.657
         NTR759SW 41018
                           5.5
                                 26
                                      4 * 21.0
911211A
                                                 1540 1.6
                                                            787 98.08 0.673
         NTR759SW 41018
                           5.5
                                  25
                                      4 * 21.5
911211A
                                                 2990 1.6 1.564 96.19 0.657
         NTR759SW 41018
                           5.5
                                  26 11 * 21.0
911211A
                                                 3070 1.6 1.607 96.08 0.720
         NTR759SW 41018
                           5.5
                                  26
                                     7 * 23.0
911211A
                                                 3120 1.6 1,634 96.02 0.626
                           5.5 24.8 11 * 20.0
         NTR759SW 41018
911211A
                                     7 * 21.0
                                                3250 1.6 1,704 95.85 0.657
                           5.5 24.8
         NTR759SW 41018
911211A
                                                 3340 1.6 1.753 95.73 0.626
         NTR759SW 41018
                                    11 * 20.0
                           5.5
                                  25
911211A
                                                3500 1.6 1,840 95.51 0.689
                                      7 * 22.0
         NTR759SW 41018
                           5.5
                                  25
911211A
                                                             572 98.61 0.908
                                      4 * 29.0
                                                 1132 1.6
         NTR759SW 41018
                           6.4
                                  26
911211A
                                        * 28.0
                                                 1137 1.6
                                                            575 98.60 0.876
                   41018
                                      4
         NTR759SW
                           6.4
                                  25
911211A
                   30573
                           5.5 27.0
                                     5 * 22.0
                                                 1750 1.6
                                                            898 97.06 0.689
911216B
           SC8000
                                                 2330 1.6 1.208 96.05 0.720
                           5.5 27.0 12 * 23.0
                   30573
911216B
           SC8000
                                    5 * 26.0
                                                1510 1.6
                                                             771 97.48 0.814
                           6.5 25.5
                   30573
911216B
           SC8000
                                                 1530 1.6
                                                             782 97.44 0.798
                   30573 6.5 26.0 5 * 25.5
911216B
           SC8000
                                        * 27.5
                                                 2040 1.6 1.053 96.56 0.861
                           6.5 26.0 12
                   30573
911216B
           SC8000
                                        * 27.0. 2080 1.6 1,074 96.49 0.845
                           6.5 25.5 12
                   30573
911216B
           SC8000
                                                 2650 1.6 1,380 96.12 0.470
                           4.9
                                        * 15.0
                               25.0 12
911216A
           SC8000
                   35589
                                                 2670 1.6 1,391 96.09 0.438
                                        * 14.0
                          4.9 26.0
                                      5
911216A
           SC8000
                   35589
                                                 2690 1.6 1.402 96.06 0.438
                                        * 14.0
                                      5
           SC8000
                           4.9 25.0
911216A
                   35589
                                                 2740 1.6 1,428 95.99 0.438
                                        * 14.0
                           4-9 26.0
                                    12
911216A
           SC8000
                   35589
                                                 1640 1.6
                                                            840 97.60 0.532
                                        * 17.0
                                      6
 911209
           SC8000
                   35060
                           (5.5)
                                  25
                           5.5
                                                 1700 1.6
                                                             872 97.51 0.532
                                        * 17.0
                                      6
 911209
           SC8000
                   35060
                                  27
                                                1730 1.6
                                        * 17.0
                                                             888 97.46 0.532
911210B
           SC8000
                   34901
                           5.5
                                  26
                                    12
                                                 1750 1:6
                                                            898 97.43 0.548
                                    12
                                        * 17.5
           SC8000
                   34901
                           5.5
                                  26
911210B
                                                 1760 1.6
                                                             904 97.42 0.532
                                      3 * 17.0
           SC8000
                   35060
                           5.5
                                25
 911209
                                                             957 97.27 0.548
                                                 1860 1.6
                                      3 *
                                          17.5
                   35060
                           5.5
                                  27
           SC8000
 911209
                                                             957 97.26 0.595
                                    11 * 19.0
                                                 1860 1.6
                           5.5
                                  26
           SC8000
                   34901
911210B
                                                                97.12 0.579
                                                 1950 1.6 1.005
                           5.5
                                  26
                                    11 * 18.5
911210B
           SC8000
                   34901
                                                 2110 1.6 1.090 96.88 0.626
                           5.5
                                      7 * 20.0
                                  25
911210A
           SC8000
                   34953
                                                 2130 1.6 1.101 96.85 0.595
                                      7 * 19.0
                           5.5
           SC8000
                   34901
                                  26
911210B
                                      5 * 18.0
                                                 2180 1.6 1,128 96.83 0.563
                           5.5
                   35547
                                  25
911214A
           SC8000
                                                 2160 1.6 1,117 96.80 0.626
                                      7 * 20.0
                           5.5
           SC8000
                   34953
                                  25
911210A
                                                 2160 1.6 1,117 96.80 0.595
                           5.5
                                      8
                                       * 19.0
                   34953
                                  25
911210A
           SC8000
                                       * 17.5
                                                 2220 1.6 1.149 96.77 0.548
                                      5
                   35547
                          5.5
                               25.5
911214A
           SC8000
                                                 2190 1.6 1,133 96.76 0.595
                                      7
                                        * 19.0
                                  25
                   34953
                           5.5
911210A
           SC8000
                                                 2200 1.6 1.138 96.74 0.579
                                        * 18.5
                                  25
                                      8
                           5.5
911210A
           SC8000
                   34953
                                                 2210 1.6 1.144 96.72 0.563
                                      7
                                        * 18.0
                                  26
911210B
           SC8000
                   34901
                           5.5
                                                 2240 1.6 1,160 96.68 0,563
                                  25
                                        * 18.0
                                      8
           SC8000
                   34953
                           5.5
911210A
                                       * 18.5
                                                 2240 1.6 1.160 96.68 0.579
                                      5
           SC8000
                   34901
                           5.5
                                  26
911210B
                                                 2250 1.6 1.165 96.66 0.563
                                       * 18.0
                           5.5
                                  26
                                      8
911210B
          SC8000
                   34901
```

M9112YY

```
RESULT OF EXPERIMENT (MAIN
                                                     FEED
                     FEED
                    CONC PRESSTEMP CELS FLUX
                                                 EC FLOW CONC
                                                                REJ
                                                                      FLUX
  DATANO
           MEMBLENE.
                                 26 8 * 17.0
                                                2260 1.6 1.170 96.65 0.532
                    34901
                           5.5
 911210B
            SC8000
                                  25
                                    5 * 19.5
                                                2290 1.6 1.186 96.61 0.610
                    34953
 911210A
            SC8000
                           5.5
                                                2310 1.6 1,197 96.57 0.595
                                  26 10 * 19.0
 911210B
            SC8000
                    34901
                           5.5
                                                2380 1.6 1,235 96.46 0.548
                                    5 * 17.5
 911210B
            SC8000
                    34901
                           5.5
                                  26
                                                2390 1.6 1,240 96.45 0.626
                           5.5
                                  25 11 * 20.0
  911210A
            SC8000
                    34953
                                                2420 1.6 1,256 96.40 0.579
                                     2 * 18.5
 911210B
            SC8000
                    34901
                           5.5
                                  26
                                                2420 1.6 1.256 96.40 0.579
                           5.5
 911210B
            SC8000
                    34901
                                  26 10 * 18.5
                                                2430 1.6 1,262 96.39 0.610
                                  25 11 * 19.5
 911210A
            SC8000
                    34953
                           5.5
                                                2450 1.6 1,272 96.36 0.610
                                     9 * 19.5
 911210B
            SC8000
                    34901
                           5.5
                                  26
                                                2450 1.6 1,272 96.36 0.595
                                     9 * 19.0
 911210A
            SC8000
                    34953
                           5.5
                                  25
                                                2470 1.6 1,283 96.33 0.626
                                    9 * 20.0
 911210A
            SC8000
                    34953
                           5.5
                                  25
                                                2480 1.6 1,288 96.31 0.563
 911210B
            SC8000
                    34901
                           5.5
                                  26 \ 2 * 18.0
                                                2500 1.6 1,299 96.28 0.595
 911210A
            SC8000
                    34953
                           5.5
                                  25 11 * 19.0
                                                2500 1.6 1.299 96.28 0.563
            SC8000
                    34953.
                           5.5
                                  25
                                    5 * 18.0
 911210A
                                     2 * 18.0
                                                2520 1.6 1,310 96.25 0.563
 911210A
            SC8000
                    34953
                           5.5
                                  25
                    34953
                           5.5
                                  25 9 * 19.0
                                               2530 1.6 1,315 96.24 0.595
 911210A
            SC8000
                                      2 * 18.5
                                                2540 1.6 1.321 96.22 0.579
 911210A
            SC8000
                    34953
                           5.5
                                  25
 911210A
                    34953
                           5.5
                                  25
                                    5 * 17.0
                                                2550 1.6 1.326 96.21 0.632
            SC8000
                    34901
                           5.5
                                  26
                                     6 * 18.0
                                                2630 1.6 1,369 96.08 0.563
 911210B
            SC8000
                                    6 * 19.0
                    34953
                           5.5
                                  25
                                                2650 1.6 1.380 96.05 0.595
 911210A
            SC8000
                                    9 * 18.0 2680 1.6 1,396 96.00 0.563
 911210B
            SC8000
                    34901
                           5.5
                                  26
                                     6 * 18.0
 911210B
                                                2690 1.6 1.402 95.98 0.563
            SC8000
                    34901
                           5.5
                                  26
                                    2 * 18.0
                                                2780 1.6 1.450 95.85 0.563
                    34953
                                  25
911210A
            SC8000
                           5.5
                                               2790 1.6 1,455 95.84 0.563
                    34953
                                  25
                                     6 * 18.0
 911210A
            SC8000
                           5.5
                                      6 * 18.0 2840 1.6 1.482 95.76 0.563
 911210A
            SC8000
                    34953
                           5.5
                                 25
                                 911210A
            SC8000
                    34953
                           5.5
 911210A
            SC8000
                    34953
                           5.5
 911210A
                           5.5
            SC8000
                    34953
                    34953
 911210A
            SC8000
                           5.5
                                 25 12 * 19.0
                                               3110 1.6 1.629 95.34 0.595
 911210A
            SC8000
                    34953
                           5.5
                                 25 12 * 19.5 3120 1.6 1.634 95.33 0.610
25 4 * 19.0 3150 1.6 1.650 95.28 0.595
            SC8000
                    34953
                           5.5
 911210A
            SC8000
                    34953
 911210A
                           5.5
                                    1 * 19.0 3190 1.6 1.672 95.21 0.595
 911210B
            SC8000
                    34901
                           5.5
                                 26
                                     1 * 18.0 3360 1.6 1,764 94.95 0.563
 911210B
            SC8000
                    34901
                           5.5
                                 26
                                  25 4 * 18.0 3540 1.6 1.862 94.67 0.563
            SC8000
 911210A
                    34953
                           5.5
                                                3610 1.6 1.900 94.56 0.563
                                    4 * 18.0
 911210B
            SC8000
                    34901
                           5.5
                                  26
                                                3680 1.6 1.938 94.45 0.563
                           5.5
                                     4 * 18.0
 911210B
            SC8000
                    34901
                                 26
                                                3690 1.6 1,944 94.44 0.563
 911210A
            SC8000
                    34953
                           5.5
                                  25
                                     4 * 18.0
                                                4170 1.6 2.206 93.68 0.579
                                     3 * 18.5
 911210B
            SC8000
                    34901
                           5.5
                                 26
                                                5100 1.6 2,717 92.22 0.579
                                 26
                                     3 * 18.5
 911210B
            SC8000
                    34901
                           5.5
                                                6850 1.6 3,686 89.45 0.657
 911210A
            SC8000
                    34953
                           5.5
                                 25
                                      3 * 21.0
                                                6950 1.6 3,742 89.29 0.642
 911210A
            SC8000
                    34953
                           5.5
                                 .25
                                     1 * 20.5
                    34953
                           5.5
                                 25
                                     1 * 21.5
                                                7960 1.6 4,305 87.68 0.673
 911210A.
            SC8000
                    34953 5.5
                                 25
                                     3 * 21.0
                                                8560 1.6 4.642 86.72 0.657
            SC8000
 911210A
                    34953 5.5
                                     1 * 20.0
                                                9210 1.6 5.007 85.68 0.626
                               25
            SC8000
 911210A
                                       * 21.0
                    34953 5.5
                                                9550 1.6 5,198 85.13 0.657
            SC8000
                                 25
                                      -3
 911210A
                    35060 5.5
                                                2030 4.0 1.047 97.01 0.563 🕏
  911209
                                       * 18.0
            SC8000
                                  26
                                     - 6
                    35547 5.5
                                                2090 4.0 1.079 96.96 0.516
                                     5 * 16.5
 911214A
            SC8000
                                  2.6
                                                2070 4.0 1,069 96.95 0.532
                                      6 * 17.0
                    35060 5.5
                                  25
  911209
            SC8000
                                                2130 4.0 1.101 96.90 0.532
                    35547 5.5
                                      5 * 17.0
                                 26.
 911214A
            SC8000
                    35060
                                      3 * 19.0 2230 4.0 1.154 96.71 0.595
                           5.5
                                  25
  911209
            SC8000
```

```
M9112YY
                   RESULT OF EXPERIMENT (MAIN
                                                 )
                                                      FEED
                    FEED
                    CONC PRESSTEMP CELS FLUX
                                                 EC FLOW CONC
                                                                 REJ
         MEMBLENE
 DATANO
                           5.5
                                 26 3 * 18.0
                                                2460 4.0 1.278 96.35 0.563
                   35060
 911209
          SC8000
                          5.9 25.0
5.9 25.0
                                                2130 1.6 1.101 96.91 0.610 C
                                     5 * 19.5
                   35589
911216A
          SC8000
                                     5 * 19.0
                                                2190 1.6 1.133 96.82 0.595
911216A
          SC8000
                   35589
                          5.9 25.0 12 * 21.0
                                                2690 1.6 1,402 96.06 0.657
911216A
          SC8000
                   35589
                                                2730 1.6 1,423 96.00 0.657
                           5.9 25.0 12 * 21.0
911216A
          SC8000
                   35589
                                                1400 1.6
                                                            713 97.97 0,704 04
                               26
                                    6 * 22 5
 911209
          SC8000
                   35060
                           6.4
                                                1490 1.6
                                                            761 97.83 0.775
                                    3 * 24.8
                                 26
 911209
          SC8000
                   35060
                           6.4
                                                            998 97.19 0.6896
                                                1938 1.6
          SC8000
                   35547
                           6.4
                                 26
                                     5 * 22.0
911214A
                                                2000 1.6 1,031 97.10 0.689
                          6.4 25.5
                                      5 * 22.0
          SC8000
                   35547
911214A
                                                2820 1.6 1.472 96.41 0.470 O
2820 1.6 1.472 96.41 0.473
                                     5 * 15.0
911211A
                  41018
                          5.5 24.8
          SC8000
                   41018
                          5.5
                                26
                                      5 * 15.1
911211A
         SC8000
                                                2890 1.6 1,509 96.32 0.454
                          5.5
                                 25
                                     5 * 14.5
          SC8000
                  41018
911211A
                                                2130 1.6 1,101 97.32 0.626 0
                          \frac{6.4}{6.4}
                                 26
                                     5 * 20 0
911211A
          SC8000
                   41018
                                                2220 1.6 1.149 97.20 0.610
71.9 1.6 33 97.88 1.252
75.7 1.6 34 97.81 1.189
                                     5 * 19.5
                                 25
          SC8000
                   41018
911211A
                          1.5 24.0
                                     4 * 40.0
          UTC70
                    1556
911217
                    1556
                          1.5 25.0
                                     4 * 38.0
          UTC70
 911217
                                                           45 97.11 1.220
                          1.5 24.0
                                                96.9 1.6
                                     5 * 39.0
 911217
          UTC70
                    1556
                                                99.4 1.6
                                                           46 97.04 1.502
          UTC70
                    1556
                          1.5 24.0
                                     1 * 48.0
 911217
                                     5 * 38.0
                    1556
                          1.5 25.0
                                                 106 1.6
                                                           49 96.85 1.189
          UTC70
 911217
                                                 106 1.6
                                                            49 98.85 1.455
                           1.5 25.0
                                     1 * 46.5
          UTC70
                    1556
 911217
                                                 107 1.6 49 96.85 1.220
                          1.5 24.0
                                     6 * 39.0
          UTC70
                    1556
 911217
                                                 114 1.6
                                                           53 96.59 1.189
                          1.5 25.0
                                     6 * 38.0
          UTC70
                    1556
 911217
                          1.5 24.0 12 * 42.5
                                                 126 1.6
                                                             59 96.21 1.330
          UTC70
                    1556
 911217
                                                 134 1.6
                                                             63 95.95 1.314
                    1556
                          1.5 \ 25.0 \ 12 * 42.0
          UTC70
911217
                                                             64 95.89 1.252
                          1.5 24.0
                                     3 * 40.0
                                                 138 1.6
          UTC70
                    1556
 911217
                                                 144 1.6
                                                             67 95,69 1.220
                          1.5 24.0
                                     9 * 39.0
          UTC70
                    1556
 911217
                                                             68 95.63 1.220
                                     3 * 39.0
                                                145 1.6
        UTC70
                    1556
                          1.5 25.0
 911217
                                     7 * 41.5
                                                 150 1.6
                                                             70 95.5 1.298
          UTC70
                    1556
                          1.5 24.0
 911217
                         1.5 25.0
                                     9 * 38.0
                                                 152 1.6
                                                             71 95.44 1.189
                    1556
 911217
          UTC70
                                                 154 1.6
                                                             72 95.37 1.408
                              24.0
                                     8 * 45.0
          UTC70
                    1556
                          1.5
 911217
                                                 156 1.6
                                                             73 95.31 1.252
                                     7 * 40.0
                          1.5 25.0
          UTC70
                    1556
 911217
                                                 162 1.6
                                                             76 95.12 1.377
                          1.5 24.0 11 *
                                            44
                    1556
 911217
          UTC70
                                                165 1.6
                                     8 * 44.0
                                                             78 94 99 1.377
                    1556
                              25.0
911217
          UTC70
                          1.5
                                                 169 1.6
                                                            80 94.86 1.361
                              25.0\ 11 * 43.5
911217
          UTC70
                    1556
                          1.5
                                                 194 1.6
207 1.6
                                                             92 94.09 1.408
                                     2 * 45.0
911217
          UTC70
                    1556
                          1.5 24.0
                                                             98 93.7 1.345
                                     2 * 43.0
          UTC70
                    1556
                          1.5 25.0
 911217
                                                             24 98.46 1.252
                                                  54 4.0
 911217
          UTC70
                    1556
                          1.5 25.0
                                     4 * 40.0
                                                             24 98.46 1.158
          UTC70
                    1556
                          1.5 25.0
                                     4 * 37.0
                                                  54 4.0
 911217
                                                            33 97.88 1.408
                                     1 * 45.0
                                                72.4 4.0
          UTC70
                    1556
                          1.5 25.0
 911217
                                                75 4.0
                                                             34 97.81 1.439
                                     1 * 46.0
         UTC70
                    1556
                          1.5 25.0
 911217
                                                             35 97.75 1.220
                          1.5 25.0
                                                77 4.0
                    1556
                                     5 * 39.0
          UTC70
 911217
                          1.5 25.0
                                               85.4 4.0
                                                             39 97.49 1.189
                                     5 * 38.0
          UTC70
                    1556
 911217
                                                  86 4.0
                                                             39 97.49 1.064
                         1.5 25 0
                                     6 * 34.0
                    1556
          UTC70
911217
                                     3 * 37.5
                                                             45 97.11 1.173
                                                  98 4.0
                    1556 1.5 25.0
          UTC70
911217
                    1556 1.5 25.0
                                     3 * 41.0
                                                99.6 4.0
                                                             46 97.04 1.283
          UTC70
 911217
                                                             46 97.04 1.314
                         1.5 \ 25.0 \ 12 * 42.0
                                                100 4.0
                    1556
 911217
          UTC70
                                                             46 97.04 1.173
                    1556 1.5 25.0
                                     9 * 37.5
                                                99.1 4.0
          UTC70
911217
                                                             51 96.72 1.032
                    1556 1.5 25.0
                                     6 * 33.0
                                                110 4.0
          UTC70
911217
                         1.5 25.0
                                                             52 96.66 1.252
                                     9 * 40.0
                                                 112 4.0
                    1556
911217
          UTC70
                                     4 * 32.0
                                                60.7 8.0
                                                             27 98.26 1.001
                          1.5 25.0
                    1556
911217
          UTC70
                                                             34 97.81 1.173
                          1.5 25.5
                                     1 * 37.5
                                                74.2 8.0
          UTC70
                    1556
911217
```

M9112YY RESULT OF EXPERIMENT (MAIN FEED FEED DATANO MEMBLENE CONC PRESSTEMP CELS FLUX EC FLOW CONC REJ FLUX 6 * 23.092 8.0 97.3 0.719 911217 1556 1.5 25.0 42 UTC70 47 96.98 1.001 911217 UTC70 1556 1.5 25.0 5 * 32.0102 8.0 1.5 25.0 138 8.0 509 1.6 64 95.89 0.782 911217 UTC70 1556 3 * 25.0 30573 27.0 250 99.18 1.377 911216B 5.5 9 * 44.0UTC80HF 5.5 27.0 2 * 40.0518 1.6 255 99.17 1,252 911216B UTC80HF 30573 0 6.5 9 * 53.0 422 1.6 206 99.33 1.659 911216B UTC80HF 30573 25.5 435 1.6 451 1.6 9 * 54.0212 99.31 1.690 911216B UTC80HF 30573 6.5 26.0 2 * 50.0 221 99.28 1.565 911216B UTC80HF 30573 6.5 26.0 460 1.6 225 99.26 1.565 UTC80HF 30573 6.5 25.5 2 * 50.0 911216B 0 911216A UTC80HF 35589 4.9 26.0 9 * 27.0758 1.6 378 98.94 0.845 35589 4.9 25.0 9 * 27.5 768 1.6 383 98.92 0.861 911216A UTC80HF 35589 4.9 25.0 2 * 25.0788 1.6 393 98.90 0.783 911216A UTC80HF 4.9 26.0 * 25.0 790 1.6 394 98.89 0.783 911216A UTC80HF 35589 2 332 99.07 1.096 911214A 9 * 35.0670 1.6 UTC80HF 35547 5.5 25 9 * 34.5671 1.6 333 99.06 1.080 UTC80HF 35547 5.5 25.5 911214A 2 * 33.0 685 1.6 340 99.04 1.033 UTC80HF 35547 5.5 25.5 911214A 702 1.6 349 99.02 1.002 UTC80HF 5.5 25 2 * 32.035547 911214A 750 97.86 1.096 25 1 * 35.01470 1.6 UTC80HF 35060 5.5 911209 27 1 * 36.0 1570 1.6 803 97.71 1.127 35060 5.5 911209 UTC80HF 2 * 38.0 2090 1.6 1.079 96.92 1.189 35060 25 911209 UTC80HF 5.5 2 * 38.0 2370 1.6 1.229 96.49 1.189 UTC80HF 35060 5.5 27 911209 265 99.25 1.221 26 9 * 39.0538 4.0 35547 5.5 911214A UTC80HF 282 99.21 1.127 9 * 36.0572 4.0 35547 26 911214A UTC80HF 5.5 2 * 34.0597 4.0 295 99.17 1.064 911214A UTC80HF 35547 5.5 26 297 99.16 1.064 2 * 34.0601 4.0 911214A UTC80HF 35547 5.5 26 UTC80HF 708 97.98 1.424 1 * 45.5 1390 4.0 35060 5.5 25 911209 $\dot{2}6$ 1 * 44.0 1534 4.0 784 97.76 1.377 35060 911209 UTC80HF 5.5 25 2 * 43.0 2120 4.0 1,095 96.88 1.346 5.5 911209 UTC80HF 35060 2 * 42.0 2310 4.0 1,197 96.59 1.315 911209 UTC80HF 35060 5.5 26 9 * 38.5302 99.15 1.205 911216A UTC80HF 35589 5.9 25.0 611 1.6 307 99.14 1.127 9112161 UTC80HF 35589 5.9 25.0 2 * 36.0620 1.6 312 99.12 1.236 5.9 25.0 9 * 39.5630 1.6 UTC80HF 35589 911216A 2 * 35.0 643 1.6 319 99.10 1.096 UTC80HF 35589 -5.9 25.0 911216A 9 * 45.0 586 1.6 289 99.19 1.409 UTC80HF 35547 6.4 26 911214A 607 1.6 9 * 46.0300 99.16 1.440 6.4 25.5 911214A UTC80HF 35547 624 1.6 309 99.13 1 283 26 2 * 41.0911214A UTC80HF 35547 6.4 634 1.6 314 99.12 1.315 2 * 42.0911214A UTC80HF 35547 6.4 25.5 819 97.66 1.526 UTC80HF 1 * 48.8 1600 1.6 911209 35060 6.4 . 26 1890 1.6 2 * 51.0973 97.22 1.596 911209 UTC80HF 35060 6.4 26 9 * 52.0 482 4.0 236 99.34 1.628 UTC80HF 35547 27 911214A 6.4 257 99.28 1.409 UTC80HF 35547 6.4 27 2 * 45.0523 4.0 911214A 2 * 27.0 1047 1.6 528 98.71 0.845 UTC80HF 41018 5.5 24.8 911211A 2 * 26.51060 1.6 535 98.70 0.829 UTC80HF 41018 5.5 26 911211A 2 * 26.0 1108 1.6 560 98.63 0.814 41018 5.5 25 UTC80HF 911211A

9 * 28.0

9 * 28.0

9 * 27.0

2 * 36.0

2 * 34.5

9 * 38.0

9 * 36.5

UTC80HF

UTC80HF

UTC80HF

UTC80HF

UTC80HF

UTC80HF

UTC80HF

911211A

911211A

911211A

911211A

911211A

911211A

911211A

41018 5.5 24.8

6.4

2.5

26

26

25

26

25

41018 5.5

41018 5.5

41018 6.4

41018 6.4

41018 6.4

41018

1340 1.6

1420 1.6

1420 1.6

907 1.6

1095 1.6

1113 1.6

681 98.34 0.876

724 98.23 0.876

724 98.23 0.845

455 98.89 1.080

553 98 65 1.189

562 98.63 1.142

883 1.6 442 98.92 1.127

```
M9112YY
                                                   ) . .
                    RESULT OF EXPERIMENT (MAIN
                                                        FEED
                     FEED
                                                   EC:
                                                       FLOW
                                                             CONC
                          PRESSTEMP CELS FLUX
                                                                  REJ
                                                                          FLUX
          MEMBLENE
                     CONC
 DATANO
                                                              370 99.10 1.252
                            6.4 28.0
                                       2 * 40.0
                                                   742 4.0
          UTC80HF
                    40984
911211B
                            6.4 28.0
                                                              475
                                                                  98.84 1.346
          UTC80HF
                    40984
                                       9
                                         *
                                           43.0
                                                   945
                                                       4.0
911211B
                                                              148 99.52 1.033
911216B
          UTC80HR
                    30573
                            5.5 27.0
                                       1
                                         *
                                           33.0
                                                   307 1.6
                                                                                a
                            5.5 27.0
                                       8 * 42.0
                                                   812 1.6
                                                              406 98.67 1.315
          UTC80HR
                    30573
911216B
                                                              121 99.60 1.283
                                       1 * 41.0
                                                   252 1.6
          UTC80HR
                    30573
                            6.5 26.0
911216B
                                                   259 1.6
                                                              124 99.59 1.221
          UTC80HR
                    30573
                            6.5 25.5
                                       1
                                         * 39.0
911216B
                                                   734 1.6
                                                              365 98.81
                                                                         1.534
          UTC80HR
                    30573
                            6.5 26.0
                                       8
                                         * 49.0
911216B
                                                              370 98.79
                                                   742 1.6
                                                                         1.502
          UTC80HR
                    30573
                            6.5 25.5
                                       8 * 48.0
911216B
                                                              226 99.36
                                                                         0.642
          UTC80HR
                    35589
                            4.9 26.0
                                       1 * 20.5
                                                   462 1.6
                                                                                0
911216A
                                                              240 99.33
                                                                         0.626
          UTC80HR
                    35589
                            4.9 25.0
                                       1 * 20.0
                                                   489 1.6
911216A
                                                              681 98.09
                    35589
                            4.9 26.0
                                       8 * 26.0
                                                  1340 1.6
                                                                         0.814
          UTC80HR
911216A
                                                              737 97.93
                    35589
                            4.9 25.0
                                       8 * 26.0
                                                  1445 1.6
                                                                         0.814
911216A
          UTC80HR
                                       1 * 27.0
                                                   397 1.6
                                                             193 99.46
                            5.5 25.5
                                                                         0.845
          UTC80HR
                    35547
911214A
                                                              213 99.40 0.845
                    35547
                                   25
                                       1 * 27.0
                                                   436 1.6
          UTC80HR
                            5.5
911214A
                                                              792 97.77 0.751
                                   25
                                       8 * 24.0
                                                  1550 1.6
          UTC80HR
                    35547
                            5.5
911214A
                                                              850 97.61 0.720
                                       8
                                         * 23.0
                                                  1660 1.6
          UTC80HR
                    35547
                            5.5 25.5
911214A
                                                              174 99.51 0.861
                                       1
                                         * 27.5
                                                   358 4.0
                    35547
                            5.5
                                   26
9112148
          UTC80HR
                                                   376 4.0
                                                              183 99.49 0.845
                    35547
                                   26
                                       1
                                         * 27.0
          UTC80HR
                            5.5
911214A
                                                   820 4.0
                                                              410 98.83 0.916
                    35076
                                      12 * 19.5
          UTC80HR
                            5.5 26.0
 911208
                                     12 * 18.5
                                                              423 98.79
                                                                         0.869
                                27.0
                                                   845 4.0
          UTC80HR
                    35076
                            5.5
 911208
                                                              529 98.49
                                                  1050 4.0
                                                                         0.878
                    35078
                                26.0
                                      12
                                         * 18.7
 911208
          UTC80HR
                            5.5
                                                              845 97.59 0.901
                                                  1650 4.0
                    35076
                                26.0
                                       8
                                           19.2
          UTC80HR
                            5.5
                                         *
 911208
                                                              861 97.55 0.901
                                                  1680 4.0
                            5.5 26.0
                                       8
                                           19.2
 911208
          UTC80HR
                    35076
                                         ¥
                                                              914 97.39 0.892
                                                  1780 4.0
                    35076
                            5.5
                                27.0
                                       8
                                           19.0
 911208
          UTC80HR
                                         *
                                                              182 99.49
                                           29.0
                                                   375
                                                       1.6
                                                                         0.908
                    35589
                                25.0
                                       1
          UTC80HR
                            5.9
                                         *
911216A
                                                              181 99.49 0.939
                                           30.0
                                                   373 1.6
                    35589
                                25.0
          UTC80HR
                            5.9
                                       1
                                         *
911216A
                                                              558 98.43 1.158
                                           37.0
                                                  1105 1.6
                    35589
                                25.0
                                       8
                                         *
911216A
          UTC80HR
                            5.9
                                           36.0
                                                              562 98.42 1.127
                                                  1112 1.6
                    35589
                                25.0
                                       8
                                         *
911216A
          UTC80HR
                            5.3
                                                              170 99.52 1.064
                                                   350 1.6
                                   26
                                           34.0
911214A
          UTC80HR
                    35547
                            6.4
                                       1
                                         *
                                                              180 99.49 1.096
                                                   370 1.6
                                           35.0
911214A
          UTC80HR
                    35547
                            6.4 25.5
                                       1
                                         ×
                                                              639 98.20 0.970
                                           31.0
                                                  1260 1.6
          UTC80HR
                    35547
                            6.4
                                   26
                                       8
                                         *
911214A
                                                              692 98.05 0.970
                            6.4 25.5
                                                  1360 1.6
          UTC80HR
                    35547
                                       8
                                         *
                                           31.0
911214A
                                                              159 99.55 1.189
          UTC80HR
                    35547
                            6.4
                                   27
                                       1 * 38.0
                                                   328 4.0
911214A
                                                              447 98.73 1.183
                            6.4 27.0 12 * 25.2
          UTC80HR
                    35076
                                                   892 4.0
 911208
                                                              454 98.71 1.174
                                      12 * 25.0
                                                   905 4.0
                    35076
                            6.4 27.0
 911208
          UTC80HR
                                                              776 97.79
                                                  1520 4.0
                                                                         1.221
                    35076
                            6.4 27.0
                                       8
                                         * 26.0
 911208
          UTC80HR
                                                              792 97.74 1.174
                            6.4 27.0
                                       8 * 25.0
                                                  1550 4.0
          UTC80HR
                    35076
 911208
                                                              373 99.09 0.626 O
                            5.5 24.8
                                       1
                                         * 20.0
                                                   748 1.6
                    41018
911211A
          UTC80HR
                                                              382 99.07 0.610
                                   26
                                         * 19.5
                                                   766 1.6
                            5.5
                                       1
911211A
          UTC80HR
                    41018
                                         * 20.0
                                                   802 1.6
                                                               401 99.02 0.626
                                   25
          UTC80HR
                    41018
                            5.5
                                       1
911211A
                                                  2110 1.6 1.090 97.34
                            5.5.24.8
                                         * 20.0
                                                                         0.626
                    41018
                                       8
911211A
          UTC80HR
                                                  2260 1.6 1.170 97.15
                                                                         0.563
                                         * 18.0
                    41018
                                   26
                                       8
911211A
          UTC80HR
                            5.5
                                                                         0.595
                                         * 19.0
                                                  2290 1.6 1.186 97.11
                    41018
                            5.5
                                   25
                                       8
911211A
          UTC80HR
                                                  2460 1.6 1.278 96.88
                                         * 18.0
                                                                         0.563
                                   26
                                       3
          UTC80HR
                    41018
                            5.5
911211A
                                                  2470 1.6 1.283 96.87
                                         * 18.0
                                                                         0.563
                                24.8
                                       3
                    41018
                            5.5
911211A
          UTC80HR
                                                  2610 1.6 1.358 96.69
                                                                         0.563
                                   25
                                       3
                                         * 18.0
911211A
          UTC80HR
                    41018
                            5.5
                                                              280 99.32
                                                                         0.829
                                         * 26.5
                                                   568 1.6
                                   26
911211A
          UTC80HR
                    41018
                            6.4
                                       1
                                                              284 99.31
                                                                         0.798
                                         * 25.5
                                                   576
                                                       1.6
911211A
          UTC80HR
                    41018
                            6.4
                                   25
                                       1
                                                              878 97.86
                                                                         0.845
                                           27.0
                                                  1712
                                                        1.6
          UTC80HR
                    41018
                            6.4
                                   26
                                       8
                                         *
911211A
                                                              884 97.84 0.783
                    41018
                                   25
                                       8
                                         * 25.0
                                                  1723
                                                       1.6
911211A
          UTC80HR
                            6.4
                                                   493
                                28.0
                                       1
                                         * 30.0
                                                       4.0
                                                              242 99.41
                                                                         0.939
911211B
          UTC80HR
                    40984
                            6.4
```

