

**An Overview
of the
Kramer Junction
SEGS
Recent
Performance**

**Scott Frier
KJC OPERATING
COMPANY**

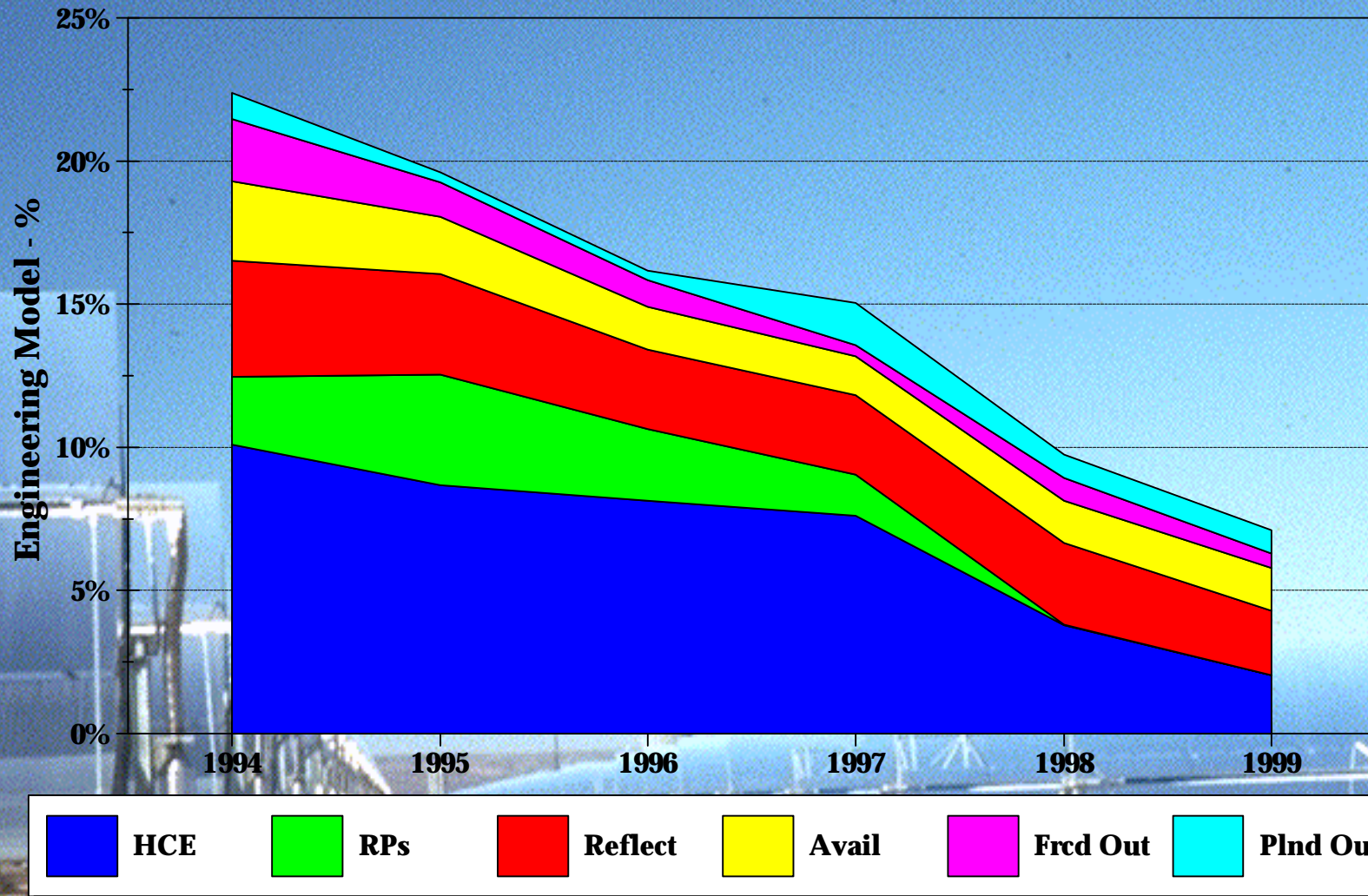
**1999 Parabolic Trough
Workshop
August 16, 1999
Ontario, California**



**41100 Hwy 395
Boron, CA 93516**

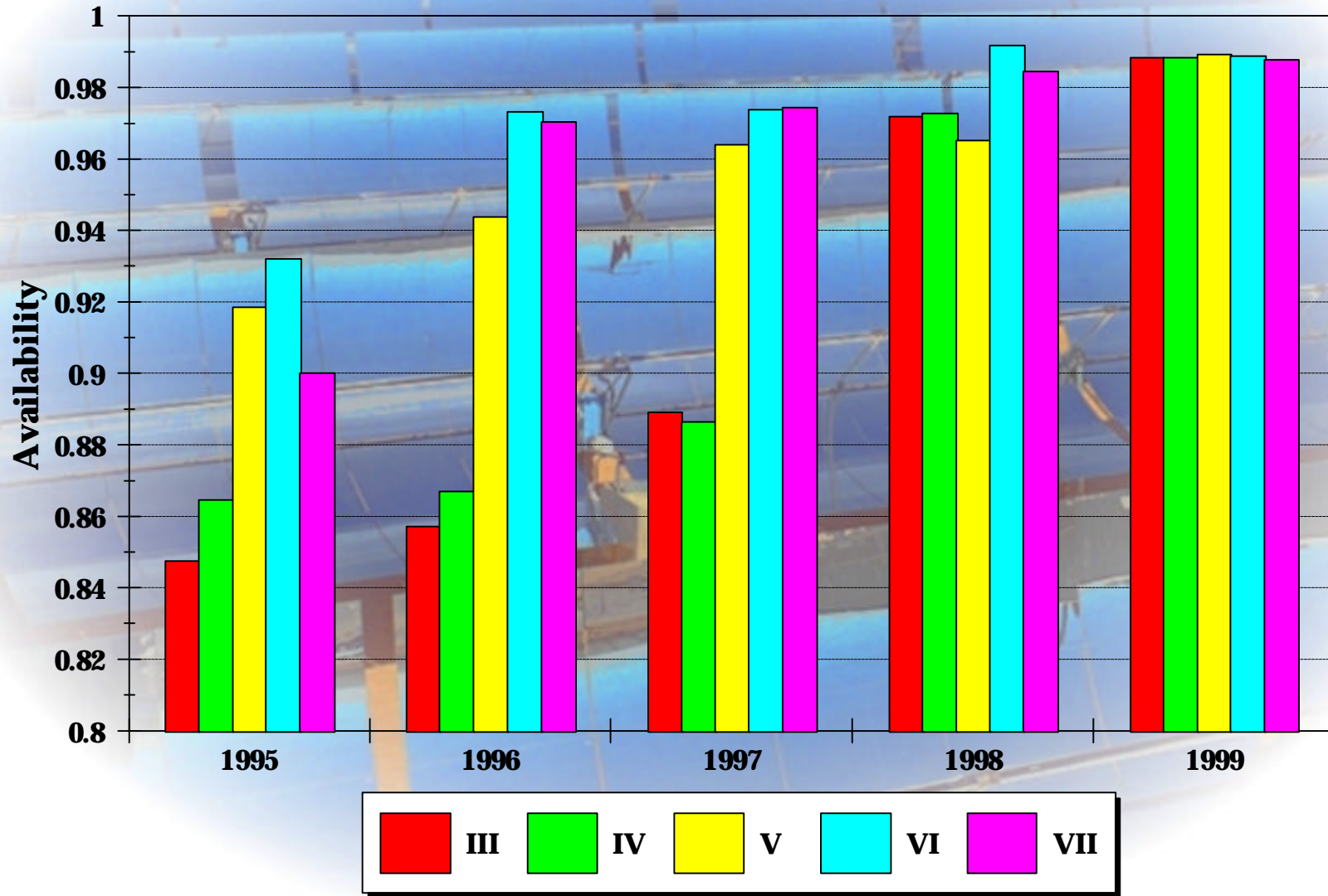


SOLAR PRODUCTION LOSSES % of Engineering Model, SEGS III-VII



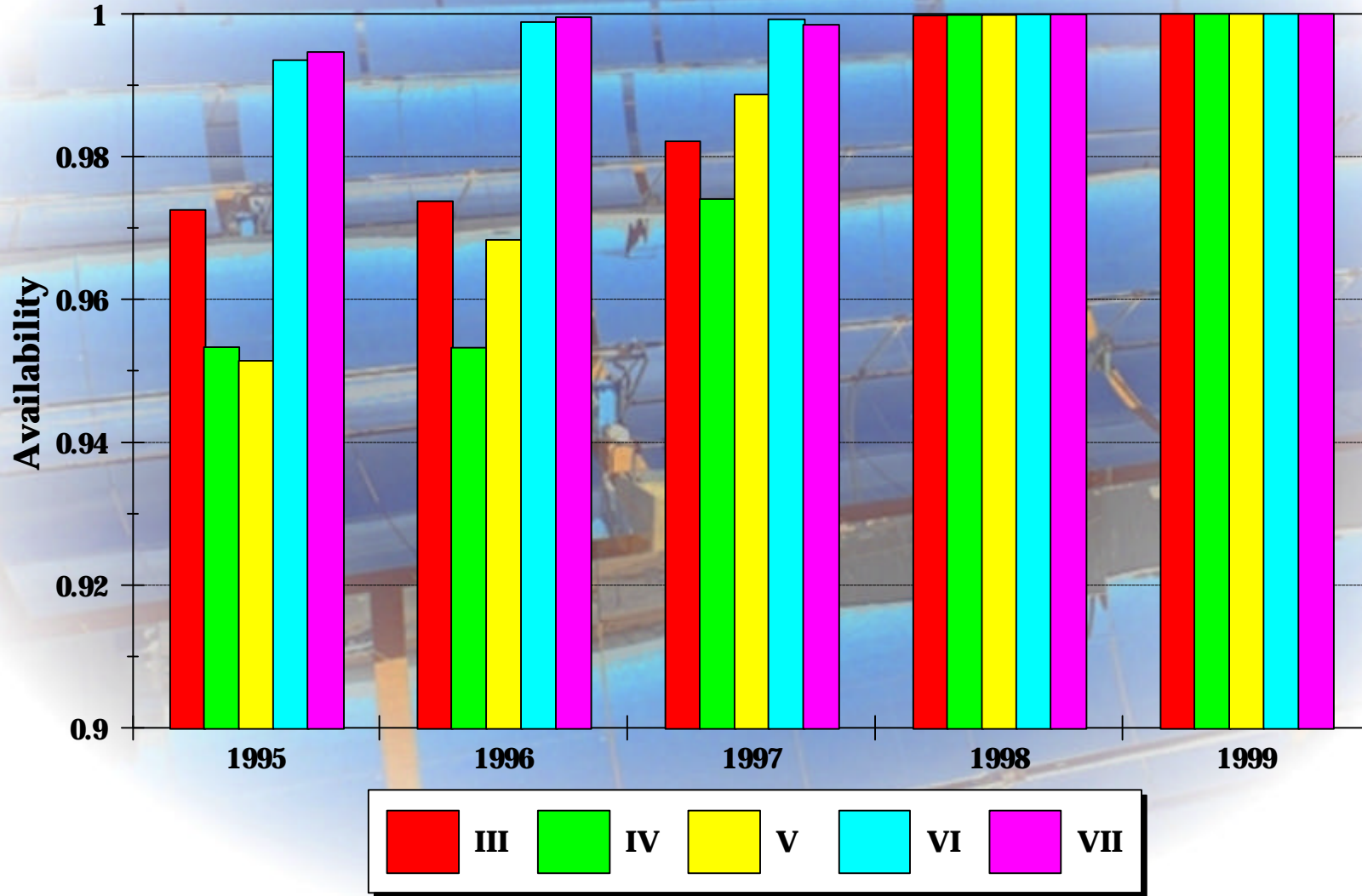


HCE AVAILABILITY Actual & Projected



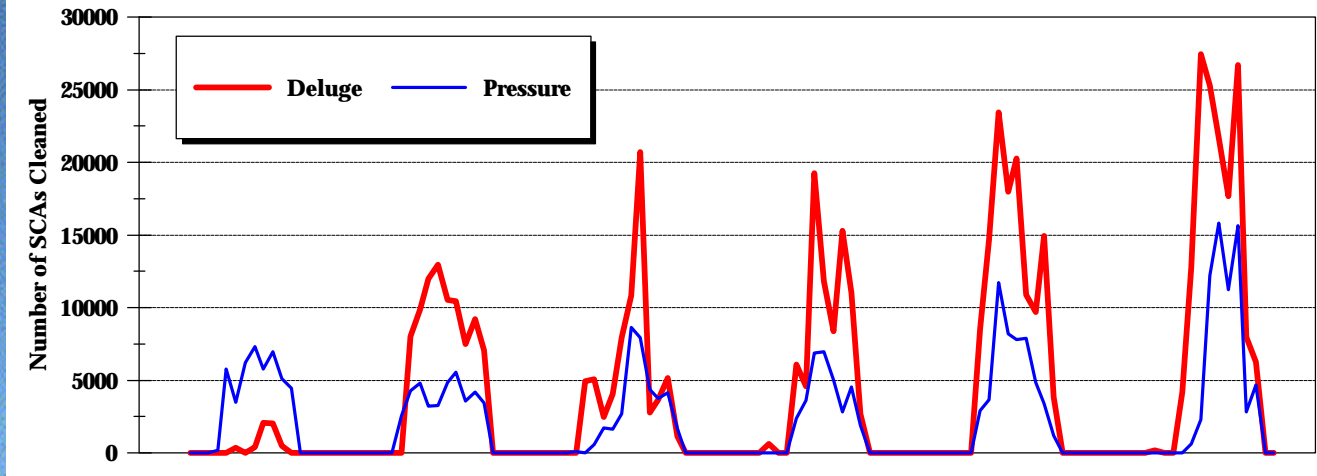


LS-2 RP AVAILABILITY Actual & Projected

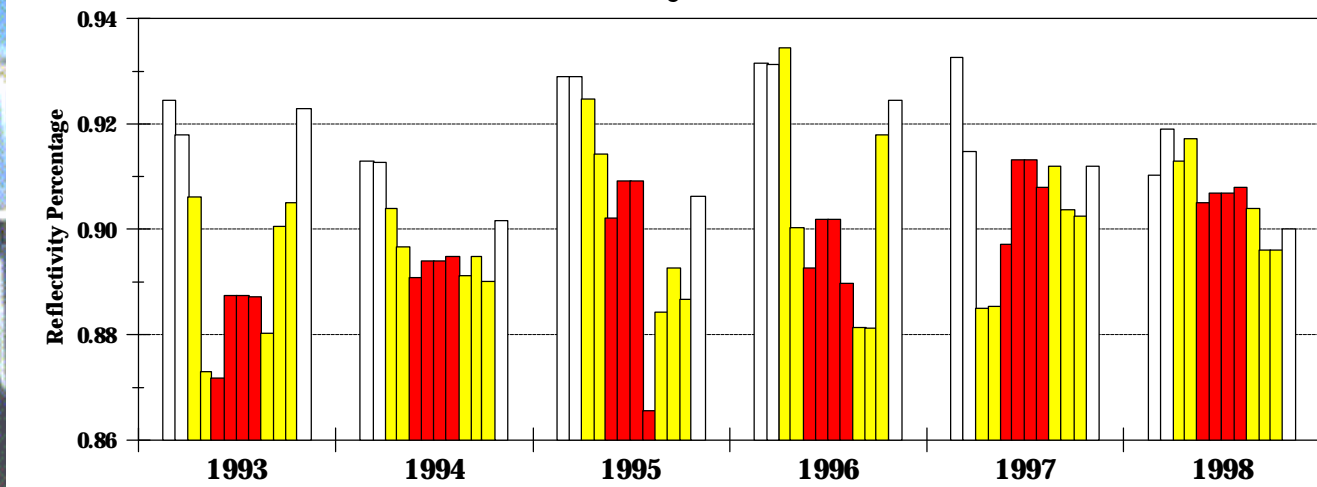


REFLECTIVITY MAINTENANCE PROGRAM

Site Cleaning Activity, SEGS III-VII



Site Reflectivity, SEGS III-VII



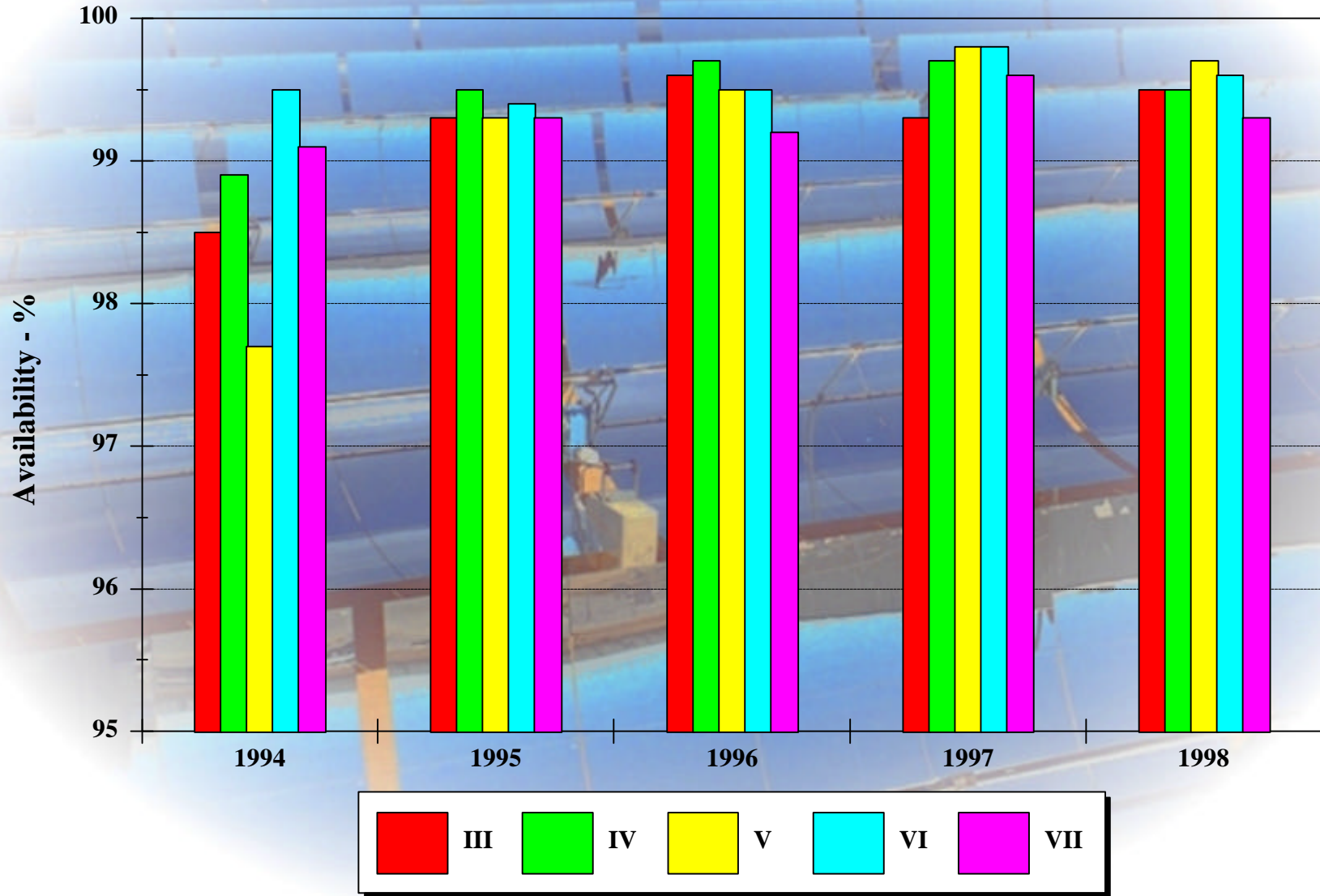
□ Jan, Feb, Dec
(Winter Months)

■ Mar, Apr, Sep, Oct, Nov
(Equinox Months)

■ May, Jun, Jul, Aug
(Summer Solstice Months)



SCA AVAILABILITY



GROSS SOLAR PRODUCTION (MWh)

Actual, 1987-1998

Year	SEGS III	SEGS IV	SEGS V	SEGS VI	SEGS VII	III - VII
1987	42,772	44,480	0	0	0	87,253
1988	60,724	63,856	62,827	0	0	187,407
1989	63,097	70,552	65,281	48,045	38,868	285,843
1990	70,510	75,801	72,449	62,682	57,661	339,103
1991	60,132	64,307	59,009	64,155	58,259	305,862
1992	48,702	50,971	55,383	47,097	46,940	249,093
1993	58,248	58,935	67,685	55,725	54,110	294,703
1994	56,892	57,795	66,255	56,934	53,281	291,157
1995	56,663	54,929	63,757	63,650	61,210	300,209
1996	64,170	61,970	71,439	71,409	70,138	339,127
1997	64,677	64,503	75,936	70,019	69,186	344,321
1998	70,598	71,635	75,229	67,358	67,651	352,471

July YTD Gross Solar Electric Production (MWh)

Year	SEGS III	SEGS IV	SEGS V	SEGS VI	SEGS VII	III .. VII
1987	28,869	30,060	0	0	0	58,930
1988	40,929	41,414	41,553	0	0	123,896
1989	41,846	45,920	42,494	29,055	23,044	182,359
1990	45,251	47,321	45,137	38,156	35,160	211,025
1991	40,775	43,096	37,189	43,194	38,953	203,207
1992	30,886	31,704	34,536	28,944	29,177	155,247
1993	37,933	37,337	43,028	34,573	33,673	186,544
1994	37,706	38,283	43,369	37,616	34,678	191,653
1995	36,484	35,059	41,489	38,010	36,692	187,734
1996	42,082	41,063	46,246	46,664	46,073	222,128
1997	41,705	41,133	50,028	45,280	45,733	223,879
1998	45,468	45,588	48,555	42,460	43,508	225,580
1999	43,361	44,652	42,064	44,580	41,427	216,084





KRAMER JUNCTION HISTORIC INSOLATION, 1989-1999

Kramer Junction Average Daily DNR Data (kWh/m²/day)

	Table 1	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Avg
Jan	5.183	6.519	5.852	4.754	4.740	3.401	5.852	3.027	6.401	4.861	5.011	5.655	5.098
Feb	6.019	6.145	5.879	6.613	4.290	4.241	5.111	6.851	4.849	7.092	4.613	6.365	5.641
Mar	6.735	7.325	6.984	6.630	3.870	6.539	7.410	6.170	7.316	8.554	7.500	6.930	6.839
Apr	8.385	8.707	7.535	8.896	6.670	8.149	7.546	8.144	9.103	8.393	8.416	7.330	8.081
May	9.290	9.190	9.368	9.596	6.927	8.463	8.612	7.674	9.649	9.242	8.562	9.318	8.782
Jun	9.849	10.360	10.312	10.166	8.675	9.554	10.820	10.044	10.620	9.929	10.662	10.498	10.149
Jul	9.423	9.906	9.624	9.194	8.549	10.239	9.288	10.402	9.335	9.845	10.663	9.471	9.683
Aug	8.738	9.594	9.355	8.850	8.091	9.466	8.935	9.973	9.253	9.176	9.572		9.227
Sep	7.950	8.528	8.807	7.261	7.524	9.443	8.115	9.370	9.375	7.780	7.981		8.418
Oct	7.076	7.261	8.208	7.503	6.108	6.904	7.149	8.140	7.661	8.351	7.802		7.509
Nov	5.697	6.950	6.905	6.496	5.994	6.176	6.830	6.683	6.448	5.445	6.814		6.474
Dec	4.905	6.330	6.283	4.290	4.374	6.141	5.070	5.408	4.782	6.008	7.118		5.580
Avg	7.443	8.077	7.938	7.521	6.337	7.409	7.573	7.654	7.922	7.896	7.913		7.642

Kramer Junction Average Daily DNR Data - YTD (kWh/m²/day)

		1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Avg
Jan	5.183	6.519	5.852	4.754	4.740	3.401	5.852	3.027	6.401	4.861	5.011	5.655	5.098
Feb	5.580	6.342	5.865	5.636	4.468	3.800	5.500	4.842	5.587	5.920	4.822	5.992	5.283
Mar	5.978	6.680	6.250	5.979	4.275	4.743	6.158	5.299	6.187	6.827	5.745	6.315	5.824
Apr	6.580	7.187	6.571	6.708	4.877	5.595	6.505	6.010	6.918	7.219	6.412	6.569	6.392
May	7.136	7.598	7.146	7.301	5.302	6.184	6.938	6.352	7.482	7.634	6.854	7.133	6.886
Jun	7.586	8.056	7.670	7.776	5.863	6.742	7.581	6.964	8.004	8.014	7.485	7.691	7.429
Jul	7.854	8.326	7.956	7.983	6.259	7.253	7.831	7.467	8.203	8.282	7.950	7.951	7.762
Aug	7.967	8.488	8.135	8.094	6.496	7.536	7.972	7.786	8.340	8.396	8.157		7.952
Sep	7.965	8.493	8.208	8.002	6.612	7.745	7.987	7.960	8.457	8.328	8.137		8.007
Oct	7.874	8.367	8.208	7.951	6.564	7.660	7.902	7.979	8.380	8.331	8.103		7.959
Nov	7.679	8.240	8.091	7.821	6.516	7.526	7.806	7.862	8.210	8.072	7.987		7.829
Dec	7.443	8.077	7.938	7.521	6.337	7.409	7.573	7.654	7.922	7.896	7.913		7.642



1998 ANNUAL PRODUCTION SUMMARY

Performance	III	IV	V	VI	VII	Total
Insolation						
DNR-% Table 1	106.3	106.3	106.3	106.3	106.3	106.3
Gross Electrical Prod						
Gross Solar - MWh	70598	71635	75229	67358	67651	352471
Gross Boiler - MWh	32663	32856	36887	31663	33470	167539
Gross Total - MWh	103261	104491	112116	99021	101121	520010
Net Elec Sold - A Chan						
On-Pk - MWh	16279	16074	16716	17143	16907	83119
Mid-Pk - MWh	58551	58897	63221	52574	54218	287462
Off-Pk - MWh	19166	19278	20410	17757	17639	94252
Super Off - MWh	0	0	0	0	0	0
Total - MWh	93996	94250	100347	87474	88764	464832
Net Purch - B Chan						
On-Pk - MWh	0	2	1	0	2	6
Mid-Pk - MWh	342	318	283	476	458	1877
Off-Pk - MWh	1254	1220	1407	1533	1474	6888
Super Off-Pk - MWh	617	568	665	711	696	3258
Total - MWh	2214	2108	2356	2720	2631	12028
Station Load						
Station Internal - MWh	9265	10241	11769	11547	12357	55178
Station Ext (B Ch) - MWh	2214	2108	2356	2720	2631	12028
Station Total - MWh	11478	12349	14125	14267	14987	67206
Station Internal - % of Gross	9.00%	9.80%	10.50%	11.70%	12.20%	10.60%
SCE Capacity Factor						
On-Pk - %	104	103	107	109	108	106
Mid-Pk - %	66	66	71	67	62	67
Off-Pk - %	17	17	18	17	15	17
Natural Gas Use						
Boiler - KSCF	411104	422372	455258	339460	359356	397510
Heater - KSCF	20048	15476	23512	2118	1080	12447
Total - KSCF	431152	437848	478770	341578	360436	409957
FERC Calc (LHV)						
Solar Input - MMBtu	1186056	1203316	1317270	939047	990663	1127270
Gas Used - MMBtu	394820	400581	438508	312739	329807	375291
Monthly FERC Ratio	24.97	24.98	24.98	24.98	24.98	24.98