

stock and all data on opening inventories, refinery closing inventory, product lifted, local sales, and refinery consumption (Screens 2 to 4) remain unchanged.

The preliminary allocation file is saved under a different name and the initial DOP of the participants in Screen 1 is updated. Instead of the participants' submitted DOPs, the production from the allocation LPs of the participants are entered on Screen 1, subject to following exceptions:

- Only positive production of fixed grades as per allocation LPs and process stock buildup or drawdown as reflected in the LPs are entered.
- Actual crude run of the participants as per the allocation LPs is entered in Screen 1.
- Ideally there should be no forecaster changes for all fixed grades and process stocks reflected in the allocation LPs, except for small rounding errors due to conversion of LP figures in thousand barrels per day to DOP figures in barrels per month. The rounding error is the difference between the allocated production as per preliminary allocation of that grade and the DOP figure of the participant entered on Screen 1.
- If process stocks are not modeled in the LPs, the forecaster change for the product or stock is identical to that in the preliminary allocation.
- If any process stock production, positive or negative, cannot be fully reflected in the allocation LP (due to an LP convergence problem or underutilization of a key conversion unit), the difference between the allocated production of the grade and the initial DOP of the participant (Screen 1) is reflected as forecaster change for that participant.

The program calculates the rest of the data, such as allocation of balancing grades, in a manner similar to that for the preliminary allocation.

We see that, in the final allocation, only the allocation of balancing grades and refinery losses change from the preliminary allocation. The rest of the report is identical to the preliminary allocation report.

PRODUCT ALLOCATION PROBLEMS

DUMPING OF KEROSENE INTO DIESEL

Due to constraints on the storage capacity or available ullage to sustain the refinery production rate of middle distillates, the refinery is some-

**Table 16-21
Retrospective DOP (bbi)**

PRODUCT (1)	AOC		AOC		BOC		BOC		BOC		BOC REFINERY		ACTUAL PRODUCTION (13)	DELTA (14)
	DOP (2)	FORECASTER (3)	FC (4)	CRUDE (5)	DOP (6)	DOP (7)	FORECASTER (8)	COMPENS. (9)	CRUDE (10)	DOP (11)	RETRO. (12)			
1138B	50396	0			50396	35242	0				35242	85638	85638	0
1149B	13451	0			13451	12117	0				12117	25568	25568	0
150	19067		-88	0	18979	0		-18	0	-18	18961	19553	19553	592
201	204504		973	0	205477	50906		189	0	51095	256572	0	0	-256572
210	622971		916	1	623888	151556		180	0	151736	775625	1029704	1029704	254079
220	0	0			0	570					575	575	575	0
383	17700	-14			17686	0	0			0	17686	17686	17686	0
390	88050	-11			88039	0	0			0	88039	88039	88039	0
395	87660	11			87671	16920	6			16926	104597	104597	104597	0
397	215748		1474	0	217222	58918		301	0	59219	276441	289195	289195	12754
397E	0	0			0	3390	-6			3384	3384	3384	3384	0
398	67500	8			67508	0	0			0	67508	67508	67508	0
411	90	10			100	0	0			0	100	100	100	0
419	220290	0			220290	0	-12			-12	220278	220278	220278	0
434	310170	-262			309908	0	0			0	309908	309908	309908	0
440	376971		20924	1	397896	144019		325	0	144344	542240	944758	944758	402518
711	0	0			0	-28380	6			-28374	-28374	-28374	-28374	0
725	100740	12			100752	0	0			0	100752	100752	100752	0
800	378180	-11			378169	0	0			0	378169	378169	378169	0
876	0	-130601			-130601	0	0			0	-130601	-130601	-130601	0
876ZP	232110	-12			232098	0	0			0	232098	232098	232098	0
888	1943011		114262	2	2057275	450586		632	0	451218	2508492	2002599	2002599	-505893
892	0	-38			-38	0	-28			-28	-66	-66	-66	0
928	403650	2			403652	0	0			0	403652	403652	403652	0
961	985664		1448	2	987114	242584		803	0	243387	1230502	1345430	1345430	114928
PBFUEL	0	-657			-657	0	-644			-644	-1301	-1301	-1301	0
PCTR	-7290	-4			-7294	-1440	3			-1437	-8731	-8731	-8731	0

**Table 16-21
Continued**

PRODUCT (1)	AOC DOP (2)	AOC FORECASTER (3)	AOC FC COMPENS. (4)	AOC CRUDE (5)	AOC RETRO DOP (6)	BOC DOP (7)	BOC FORECASTER (8)	BOC FC COMPENS. (9)	BOC CRUDE (10)	BOC RETRO DOP (11)	REFINERY RETRO. DOP (12)	ACTUAL PRODUCTION (13)	DELTA (14)
PDDSL	0	0			0	1470	0			1470	1470	1470	0
PDSL	0	0			0	33570	-6			33564	33564	33564	0
PFCOO	-17790	5			-17785	-7980	1			-7979	-25764	-25764	0
PFDISO	-189000	7			-188993	-7530	-10			-7540	-196533	-196533	0
PKERO	-19637	0			-19637	0	0			0	-19637	-19637	0
PLCGAS	-18227	0			-18227	0	0			0	-18227	-18227	0
PLLCN	2237	4			2241	420	13			433	2674	2674	0
PLTISO	10800	0			10800	0	0			0	10800	10800	0
PMEISO	29610	-15			29595	5700	14			5714	35309	35309	0
PMIDSL	-20280	11			-20269	-6420	1			-6419	-26688	-26688	0
PMSR	15950	0			15950	3079	0			3079	19029	19029	0
PPOLY	0	0			0	3660	-8			3652	3652	3652	0
PP90R	0	0			0	1350	13			1363	1363	1363	0
PP95R	30900	-7			30893	5970	-6			5964	36857	36857	0
PRESID	660	5			665	120	8			128	793	793	0
PSKERO	-13	13			0	13470	3			13473	13473	13473	0
PSLOPD	0	-4045			-4045	0	-816			-816	-4861	-4861	0
PSLOPO	0	-3874			-3874	0	-845			-845	-4719	-4719	0
PSMCN	7860	-3			7857	1530	0			1530	9387	9387	0
PSWMSR	7467	0			7467	1442	0			1442	8909	8909	0
PUFCHG	-3107	8			-3099	9	-9			0	-3099	-3099	0
PWCN	0	-451			-451	0	-96			-96	-547	-547	0
LOSSES	47457			0.102	47457.102	13152				13152	60609.1	38204	-22405
CRUDE	6215520	6			6215526	1200000	0			1200000	7415526	7415526	0
COL TOTAL	6168063	-139909	139909	6	6168069	1186848	-2413	2413	0	1186848	7354917	7377323	0

NOTES:

COLUMN 3 = FORECASTER CHANGE AOC.

COLUMN 4 = FORECASTER COMPENSATING CHANGES TO BALANCING GRADES, AOC.

COLUMN 5 = CHANGES TO BALANCING GRADES DUE TO CRUDE CHANGES.

times forced to dump kerosene into diesel. Such situations can arise from failure to lift its production due to depressed kerosene sales by one or both participants. The effect of dumping of kerosene by one participant can affect the allocation of balancing grades of both the participants, and it is important that the effect of kerosene dumping be correctly modeled in the allocation and the effect confined only to the participant that caused the problem.

EXAMPLE 16-7

During the month, a refinery's kerosene inventory was becoming critical and the refinery had two options to contain the kerosene inventory: cut the crude rate of the refinery or dump kerosene to diesel.

As the problem was caused by participant BOC's nonlifting of its kerosene inventory and lack of ullage in its allocated tankage capacity, it was decided that BOC's kerosene be dumped into diesel until the end of the month.

Estimation of amount of kerosene dumped into diesel was complicated because part of this dumping was achieved by undercutting kerosene on the crude distillation unit itself. The amount of the kerosene to be dumped into diesel was estimated by determining the pour point of diesel during the period of dumping.

Table 16-22
Retrospective DOP in Terms of Balancing Grades

BALANCING GRADES	AOC		BOC		TOTAL, bbl
	bbl	%	bbl	%	
150	11460	100.00	0	0.00	11460
201	47147	98.20	864	1.80	48011
210	1095322	82.80	227578	17.20	1322900
397	416254	83.76	80716	16.24	496970
440	1016977	83.18	205589	16.82	1222566
888	1997330	84.17	375739	15.83	2373069
961	1592931	84.16	299835	15.84	1892766
LOSS	38105	79.74	9679	20.26	47784
TOTAL	6215526	83.82	1200000	16.18	7415526

Table 16-23
Allocation of Balancing-Grade Deltas (bbi)

PRODUCTS	TOTAL DELTA (1)	AOC IN TERMS OF BG (2)	BOC IN TERMS OF BG (3)	TOTAL (4)	AOC, % (5)	BOC, % (6)	FIRST STEP		REVERSE ALLOCATION		SUM OF TOTAL ALLOCATION DELTAS	
							AOC DELTA (7)	BOC DELTA (8)	AOC (9)	BOC (10)	AOC (11)	BOC (12)
I-150	592	3956	-795	3161	1.2514	-0.2514	740	-149	8	-8	748	-157
I-201	-256572	264599	51629	316228	0.8367	0.1633	-214683	-41889	3471	-3472	-211211	-45361
I-210	254079	817342	158727	976069	0.8374	0.1626	212761	41318	3438	-3438	216199	37880
I-397	12754	431747	90158	521905	0.8273	0.1727	10551	2203	173	-173	10723	2031
I-440	402518	664775	160411	825186	0.8056	0.1944	324271	78247	5446	-5446	329717	72801
I-888	-505893	2550864	431730	2982594	0.8553	0.1447	-432665	-73228	6845	-6845	-425821	-80073
I-961	114928	1434786	294988	1729774	0.8295	0.1705	95329	19599	1555	-1555	96884	18044
LOSS	-22405	47457	13152	60609	0.7830	0.2170	-17543	-4862	303	-303	-17240	-5165
TOTAL	1						-21239	21240	21239	-21240	0	0

NOTES:

COLUMN 1 BALANCING GRADES DELTAS BETWEEN ACTUAL PRODUCTION AND COMBINED RETROSPECTIVE DOP.

COLUMNS 2 AND 3 RETRO DOP OF AOC AND BOC EXPRESSED IN TERMS OF BALANCING GRADES.

COLUMNS 7 AND 8 TOTAL DELTA IN COLUMN 1 SPLIT IN THE RATIO OF RETRO DOP EXPRESSED IN TERMS OF BALANCING GRADES.

AVCTD THE ABSOLUTE VALUE OF COMBINED TOTAL DELTAS IN COLUMN 1, = 1,569,742.

COLUMNS 9 AND 10 REVERSE ALLOCATION OF DELTAS TO MAKE THE SUM OF AOC AND BOC DELTAS INDIVIDUALLY EQUAL TO ZERO.

Table 16-24
Final Product Allocation (bbi)

PRODUCT	AOC RETRO	BOC RETRO	AOC DELTA	BOC DELTA	AOC ALLOCATION	BOC ALLOCATION	ACTUAL PRODUCTION
1138B	50396	35242			50396	35242	85638
1149B	13451	12117			13451	12117	25568
150	18979	-18	748	-157	19727	-174	19553
201	205477	51095	-211211	-45361	-5734	5734	0
210	623888	151736	216199	37880	840087	189617	1029704
220	0	575			0	575	575
383	17686	0			17686	0	17686
390	88039	0			88039	0	88039
395	87671	16926			87671	16926	104597
397	217222	59219	10723	2031	227945	61250	289195
397E	0	3384			0	3384	3384
398	67508	0			67508	0	67508
411	100	0			100	0	100
419	220290	-12			220290	-12	220278
434	309908	0			309908	0	309908
440	397896	144344	329717	72801	727613	217145	944758
711	0	-28374			0	-28374	-28374
725	100752	0			100752	0	100752
800	378169	0			378169	0	378169
876	-130601	0			-130601	0	-130601
876ZP	232098	0			232098	0	232098
888	2057275	451218	-425821	-80073	1631454	371145	2002599
892	-38	-28			-38	-28	-66
928	403652	0			403652	0	403652
961	987114	243387	96884	18044	1083998	261432	1345430
PBFUEL	-657	-644			-657	-644	-1301
PCTTR	-7294	-1437			-7294	-1437	-8731
PDDSL	0	1470			0	1470	1470
PDSL	0	33564			0	33564	33564
PFCOO	-17785	-7979			-17785	-7979	-25764
PFDISO	-188993	-7540			-188993	-7540	-196533
PKERO	-19637	0			-19637	0	-19637
PLCGAS	-18227	0			-18227	0	-18227
PLLCN	2241	433			2241	433	2674
PLTISO	10800	0			10800	0	10800
PMEISO	29595	5714			29595	5714	35309
PMIDSL	-20269	-6419			-20269	-6419	-26688
PMSR	15950	3079			15950	3079	19029
PPOLY	0	3652			0	3652	3652
PP90R	0	1363			0	1363	1363
PP95R	30893	5964			30893	5964	36857
PRESID	665	128			665	128	793
PSKERO	0	13473			0	13473	13473
PSLOPD	-4045	-816			-4045	-816	-4861
PSLOPO	-3874	-845			-3874	-845	-4719
PSMCN	7857	1530			7857	1530	9387
PSWMSR	7467	1442			7467	1442	8909
PUFCHG	-3099	0			-3099	0	-3099
PWCN	-451	-96			-451	-96	-547
LOSSES	47457	13152	-17240	-5165	30217	7987	38204
COL.					6215526	1200000	7415527
TOTAL							
CRUDE	6215526	1200000			6215526	1200000	7415526

First, at the month's end, diesel tank 701 contained 120 mb I-885 inventory with a pour point of -9°C . The volume of kerosene that could be backed out to bring the diesel pour point to its normal value of -3°C is estimated, as follows, at 33 mb.

PRODUCT GRADE	POUR POINT, $^{\circ}\text{C}$	POUR POINT, $^{\circ}\text{F}$	POUR BLEND INDEX (PI)	BLEND VOLUME, mb	PI*VOL
I-885	-3.0	26.6	387	87.0	33669.0
I-440	-45	-49	47.1	33.0	1554.3
T-701	-9	15.8	295.2	120.0	35424.0
BLEND					

During the same period, a total of 118 mb of diesel (I-885) was blended and shipped with a -6°C pour point. The volume of kerosene that could be backed out to bring pour point of diesel to -3° was estimated at 17 mb, as follows:

PRODUCT GRADE	POUR POINT, $^{\circ}\text{C}$	POUR POINT, $^{\circ}\text{F}$	POUR BLEND INDEX (PI)	BLEND VOLUME, mb	PI*VOL
I-885	-3.0	26.6	387	101.0	39087.0
I-440	-45	-49	47.1	17.0	800.7
BLEND	-6	21.2	336.3	17.0	39683.0

Thus, the total downgrading of kerosene to diesel equals (33 + 17) or 50 mb.

Suppose that the downgrading of kerosene to diesel was caused by a lack of ullage in participant BOC kerosene tankage. This is reflected in the allocation as follows:

1. The allocation program is first run with correct accounting closing inventories of I-440 (KERO) and I-888 (DIESEL).
2. The allocation program is next run with closing inventory of I-440 increased by 50 mb and I-888 decreased by 50 mb.

The difference in the allocated production for the two cases is recorded as follows. This table shows the effect of dumping 50,000 bbl kerosene into diesel on the allocated production of the participants.

PRODUCT GRADE	AOC, bbl	BOC, bbl	TOTAL, bbl
I-150	177	-177	0
I-201	50	-50	0
I-210	394	-394	0
I-397	133	-133	0
I-440	-45063	-4937	-50000
I-888	43226	6774	50000
I-961	951	-951	0
TOTAL	-132	132	0

Participant AOC was originally allocated 45,063 bbl of 50,000 bbl kerosene downgrading (instead of 0) and BOC only -4937 bbl instead of 50,000 bbl. Also, there is net transfer of volume (132 bbl) from AOC to BOC.

To correct this, the following hand adjustments were made to the allocated production of the participants.

PRODUCT GRADE	AOC, bbl	BOC, bbl	TOTAL, bbl
I-150	-177	177	0
I-201	-50	50	0
I-210	-394	394	0
I-397	-133	133	0
I-440	45063	-45063	0
I-888	-43226	43226	0
I-961	-951	951	0
TOTAL	132	-132	0

The allocation delta, for the two cases after adjustment, became

PRODUCT GRADE	AOC, bbl	BOC, bbl	TOTAL, bbl
I-150	0	0	0
I-201	0	0	0
I-210	0	0	0
I-397	0	0	0
I-440	0	-50000	-50000
I-888	0	50000	50000
I-961	0	0	0
TOTAL	0	0	0

Screen 1
Initial DOPs and Forecaster Changes (Preliminary Allocation, November 1999)

GRADE	PRODUCT DESCRIPTION	INITIAL DOP			FORECASTER CHANGES			
		BOC BARRELS	AOC BARRELS	TOTAL BARRELS	ACTUAL PROD BARRELS	TOTAL DELTA BARRELS	BOC DELTA BARRELS	AOC DELTA BARRELS
I-1138	Asphalt 60/70	0	36000	36000	37467	1467	0	1467
I-1149	Asphalt 40/50	0	0	0	880	880	352	528
I-11xx	Asphalt	0	0	0	0	0	0	0
I-11xx	Asphalt	0	0	0	0	0	0	0
I-150	LPG	0	24000	24000	23160	- 840	0	0
I-151	LPG	0	0	0	0	0	0	0
I-1xx	LPG	0	0	0	0	0	0	0
I-1xx	LPG	0	0	0	0	0	0	0
I-201	LSR Naphtha	0	0	0	0	0	0	0
I-210	WSR Naphtha	362670	671320	1033990	800332	- 233658	0	0
I-220	LSR Naphtha	144000	0	144000	198553	54553	0	0
I-2xx	Naphtha	0	0	0	0	0	0	0
I-2xx	Naphtha	0	0	0	0	0	0	0
I-2xx	Naphtha	0	0	0	0	0	0	0
I-2xx	Naphtha	0	0	0	0	0	0	0
I-253	Whole Cat Naphtha	0	0	0	0	0	0	0
I-383	Mogas (83 RON, 0.84 Pb)	0	0	0	- 8268	- 8268	- 3147	- 5121
I-387	Mogas (87 RON, 0.84 Pb)	0	0	0	29039	29039	11616	17423
I-387R	Mogas (87 RON, 0.40 Pb)	0	0	0	0	0	0	0
I-387S		0	0	0	0	0	0	0
I-390E		0	0	0	0	0	0	0
I-390J	Mogas	0	105000	105000	140488	35488	0	35488
I-390R		0	0	0	0	0	0	0
I-390S	Mogas (0.40 Pb, 8 RVP)	0	0	0	0	0	0	0
I-390X		0	0	0	0	0	0	0
I-390Z	0.4 Pb, 9 RVP	207990	0	207990	209046	1056	1056	0

I-9xx	Fuel Oil	0	0	0	0	0	0	0
I-9xx	Fuel Oil	0	0	0	0	0	0	0
I-9xx	Fuel Oil	0	0	0	0	0	0	0
I-9xx	Fuel Oil	0	0	0	0	0	0	0
Pxxxx	Intermediate stock	0	0	0	0	0	0	0
Pxxxx	Intermediate stock	0	0	0	0	0	0	0
Pxxxx	Intermediate stock	0	0	0	0	0	0	0
Pxxxx	Intermediate stock	0	0	0	0	0	0	0
Pxxxx	Intermediate stock	0	0	0	0	0	0	0
Pxxxx	Intermediate stock	0	0	0	0	0	0	0
PBFUEL	Burner Fuel Oil	0	0	0	- 846	- 846	- 255	- 591
PBHDSL	Diesel Oil ex Bombay High	0	0	0	0	0	0	0
PCTISO	Isomate Cutter	0	0	0	0	0	0	0
PCTTR	Cutter Stock	0	6000	6000	2868	- 3132	0	- 3132
PDSDSL	Desulfurized Diesel	0	9000	9000	80009	71009	28404	42605
PDSL	Diesel	0	14010	14010	88946	74936	29974	44962
PFCCF	HVGO to FCCU	0	0	0	0	0	0	0
PFCCO	Hvy Isomate to FCCU	- 30990	- 27990	- 58980	- 37350	21630	11365	10265
PFDISO	HVGO to 2HDU	- 51000	- 120000	- 171000	- 161672	9328	2782	6546
PGABS	Gasoline	0	0	0	0	0	0	0
PGPDSL	Diesel ex Gippsland	0	0	0	0	0	0	0
PISIMP	Isomate Import	0	0	0	0	0	0	0
PKERIM	Kerosene Import	0	0	0	0	0	0	0
PKERO	Kerosene	0	0	0	- 5572	- 5572	- 2391	- 3181
PLANTS	Plants & Lines Contents	0	0	0	0	0	0	0
PLCGAS	Lt Cat Naphtha	33990	69000	102990	115403	12413	4097	8316
PLLCN	Lt Cat Naphtha	0	0	0	1543	1543	617	926
PLSRBS	I-220 LSR	0	0	0	0	0	0	0
PLTISO	Lt. Isomate	2010	0	2010	- 25866	- 27876	- 7758	- 20118
PMEISO	Med. Isomate Cutter	0	0	0	- 9766	- 9766	- 4470	- 5296
PMIDSL	CDU 4A M/I Diesel	6990	9990	16980	- 3349	- 20329	- 13119	- 7210
PMSR	Sour MSR Naphtha	0	0	0	- 3136	- 3136	- 1239	- 1897
POMRSD	Oman Resid Import	0	0	0	0	0	0	0
PPOLY	Polymer Gasoline	3990	6990	10980	9393	- 1587	- 577	- 1010

**Screen 1
Continued**

GRADE	PRODUCT DESCRIPTION	BOC BARRELS	INITIAL AOC BARRELS	TOTAL BARRELS	FORECASTER CHANGES			
					ACTUAL PROD BARRELS	TOTAL DELTA BARRELS	BOC DELTA BARRELS	AOC DELTA BARRELS
PP90R	90 RON Reformate	0	0	0	0	0	0	0
PP93R	93 RON Reformate	- 990	- 2010	- 3000	- 5867	- 2867	- 946	- 1921
PP95R	95 RON Reformate	0	0	0	0	0	0	0
PP96R	96 RON Reformate	9990	18000	27990	24257	- 3733	- 1332	- 2401
PRESID	Residuum	363960	15870	379830	340735	- 39095	- 37462	- 1633
PRESMI	M/I DsIs in 6VDU Feed	0	0	0	0	0	0	0
PRES75	I-725 in 6VDU Feed	0	0	0	0	0	0	0
PSKERO	Sweet Kerosene	0	0	0	658	658	263	395
PSLOPD	Slop Distillate	0	0	0	- 4714	- 4714	- 1860	- 2854
PSLOPO	Slop Oil	0	0	0	- 5518	- 5518	- 1901	- 3617
PSLOPT	Slop ex Marine Terminal	0	0	0	0	0	0	0
PSMCN	Sweet Med. Cat Naphtha	- 8010	- 15000	- 23010	- 29517	- 6507	- 2265	- 4242
PSWMSR	Sweet MSR	0	- 6000	- 6000	- 100	5900	0	5900
PUFCHG	Unifiner Feed	- 3990	0	- 3990	- 9419	- 5429	- 1859	- 3570
PUJFBS	Sour Jet B.S.	0	0	0	0	0	0	0
PWCN	Whole Cat Naphtha	0	0	0	2999	2999	1200	1799
P440BS	Jet B.S.	0	0	0	0	0	0	0
TOTAL	Finished products	2876010	4783540		7573197	- 86353	- 7816	187834
TOTAL	Process stocks	325950	- 22140		364119	60309	1268	59041
TOTAL	Finished products + Process stocks	3201960	4761400		7937316	- 26044	- 6548	246875
CRUDE	Crude oil run	3225000	4806000	8031000	8037551	6551	- 9980	16531
LOSSES		23040	44600		100235			

Screen 2
Continued

PRODUCT	OPENING INVENTORY bbls	ADJUST bbls	ALLOCATION bbls	TOTAL AVAILABLE bbls	LIFTED bbls	LOCAL SALES bbls	CONSUMED bbls	CLOSING INVENTORY bbls
I-3xx	0		0	0				0
I-400	0		0	0				0
I-411	0		0	0				0
I-419	0	237296	0	237296	237296			0
I-434	0		0	0				0
I-440	206732	-237296	591669	561105	83346			477759
I-440IM	0		0	0				0
I-4xx	0		0	0				0
I-4xx	0		0	0				0
I-4xx	0		0	0				0
I-4xx	0		0	0				0
I-4xx	0		0	0				0
I-711	0		0	0				0
I-725	0		0	0				0
I-726	0		0	0				0
I-730	0		0	0				0
I-7xx	0		0	0				0
I-7xx	0		0	0				0
I-7xx	0		0	0				0
I-800	0		0	0				0
I-80001	0		218786	218786	210332			8454
I-875	0		0	0				0
I-876	2847		0	2847				2847
I-876ZP	0		0	0				0
I-884	0		0	0				0
I-885	20332		5235	25567	25567			0
I-888	136994		650516	787510	698346	16932	314	71918
I-88852	0		0	0				0
I-8xx	0		0	0				0
I-8xx	0		0	0				0
I-8xx	0		0	0				0
I-8xx	0		0	0				0
I-8xx	0		0	0				0
I-8xx	0		0	0				0
I-8xx	0		0	0				0
I-8xx	0		0	0				0
I-8xx	0		0	0				0
I-892	15687		-104	15583				15583
I-928	0		0	0				0
I-933	0		0	0				0
I-955	0		0	0				0
I-957	0		0	0				0
I-960	0		0	0				0
I-96001	0		0	0				0
I-9601	0		0	0				0
I-9602	0		0	0				0
I-961	314131		636558	950689	1089965	1172		-140448
I-96107	0		0	0				0
I-962	0		0	0				0
I-96201	0		0	0				0
I-96202	0		0	0				0
I-971	0		0	0				0
I-97103	0		0	0				0
I-9xx	0		0	0				0

I-9xx	0	0	0	0	0	0	0	
I-9xx	0	0	0	0	0	0	0	
I-9xx	0	0	0	0	0	0	0	
I-9xx	0	0	0	0	0	0	0	
I-9xx	0	0	0	0	0	0	0	
I-9xx	0	0	0	0	0	0	0	
I-9xx	0	0	0	0	0	0	0	
I-9xx	0	0	0	0	0	0	0	
Pxxxx	0	0	0	0	0	0	0	
Pxxxx	0	0	0	0	0	0	0	
Pxxxx	0	0	0	0	0	0	0	
Pxxxx	0	0	0	0	0	0	0	
Pxxxx	0	0	0	0	0	0	0	
Pxxxx	0	0	0	0	0	0	0	
PBFUEL	3105	-255	2850				2850	
PBHDSL	0	0	0				0	
PCTISO	0	0	0				0	
PCTTR	20931	0	20931				20931	
PDSDSL	20447	28404	48851				48851	
PDSL	30211	29974	60185				60185	
PFCCF	0	0	0				0	
PFCOO	69478	-19625	49853				49853	
PFDISO	75257	-48218	27039				27039	
PGABS	0	0	0				0	
PGPDSL	0	0	0				0	
PISIMP	0	0	0				0	
PKERIM	0	0	0				0	
PKERO	64261	-2391	61870				61870	
PLANTS	27614	0	27614				27614	
PLCGAS	45273	38087	83360				83360	
PLLCN	1679	617	2296				2296	
PLSRBS	0	0	0				0	
PLTISO	21169	-5748	15421				15421	
PMEISO	22667	-4470	18197				18197	
PMIDSL	8407	-6129	2278				2278	
PMSR	8780	-1239	7541				7541	
POMRSD	0	0	0				0	
PPOLY	13885	3413	17298				17298	
PP90R	0	0	0				0	
PP93R	45566	-1936	43630				43630	
PP95R	0	0	0				0	
PP96R	45550	8658	54208				54208	
PRESID	5730	326498	332228				332228	
PRESMI	0	0	0				0	
PRES75	0	0	0				0	
PSKERO	13398	263	13661				13661	
PSLOPD	13218	-1860	11358				11358	
PSLOPO	15147	-1901	13246				13246	
PSLOPT	0	0	0				0	
PSMCN	27559	-10275	17284				17284	
PSWMSR	14008	0	14008				14008	
PUFCHG	17971	-5849	12122				12122	
PUJFBS	0	0	0				0	
PWCN	858	1200	2058				2058	
P440BS	0	0	0				0	
TOT. PROCESS	632169	0	327218	959387	0	0	959387	
TOT.FINISH PRD.	1430943	155202	2854854.18	4440999	3337715	18104	314	1084866.2
TOTAL	2063112	155202	3182072.18	5400386	3337715	18104	314	2044253.2

Screen 3
Continued

PRODUCT	OPENING INVENTORY BARRELS	ADJUST BARRELS	ALLOCATION BARRELS	TOTAL AVAILABLE BARRELS	LIFTED BARRELS	LOCAL SALES BARRELS	CONSUMED BARRELS	CLOSING INVENTORY BARRELS
I-9xx	0		0	0				0
I-9xx	0		0	0				0
Pxxxx	0		0	0				0
Pxxxx	0		0	0				0
Pxxxx	0		0	0				0
Pxxxx	0		0	0				0
Pxxxx	0		0	0				0
Pxxxx	0		0	0				0
PBFUEL	7180		-591	6589				6589
PBHDSL	0		0	0				0
PCTISO	0		0	0				0
PCTTR	2712		2868	5580				5580
PDSDSL	44409		51605	96014				96014
PDSL	46110		58972	105082				105082
PFCCF	0		0	0				0
PFCOO	61850		-17725	44125				44125
PFDISO	202441		-113454	88987				88987
PGABS	0		0	0				0
PGPDSL	0		0	0				0
PISIMP	0		0	0				0
PKERIM	0		0	0				0
PKERO	85508		-3181	82327				82327
PLANTS	41421		0	41421				41421
PLCGAS	15093		77316	92409				92409
PLLCN	3234		926	4160				4160
PLSRBS	0		0	0				0
PLTISO	54893		-20118	34775				34775
PMEISO	26858		-5296	21562				21562
PMIDSL	4620		2780	7400				7400
PMSR	13445		-1897	11548				11548
POMRSD	0		0	0				0
PPOLY	7996		5980	13976				13976
PP90R	0		0	0				0
PP93R	41797		-3931	37866				37866
PP95R	0		0	0				0
PP96R	51489		15599	67088				67088
PRESID	87622		14237	101859				101859
PRESMI	0		0	0				0
PRES75	0		0	0				0
PSKERO	25555		395	25950				25950
PSLOPD	20285		-2854	17431				17431
PSLOPO	28826		-3617	25209				25209
PSLOPT	0		0	0				0
PSMCN	48855		-19242	29613				29613
PSWMSR	21738		-100	21638				21638
PUFCHG	34502		-3570	30932				30932
PUJFBS	0		0	0				0
PWCN	1715		1799	3514				3514
P440BS	0		0	0				0
PROCESS	980154	0	36901	1017055	0	0	0	1017055
FINISH PR	1812597	0	4718342.82	6530940	3625729	297913	470	2606827.8
TOTAL	2792751	0	4755243.82	7547995	3625729	297913	470	3623882.8

I-9xx	0	0	0	0	0	0	0	0
I-9xx	0	0	0	0	0	0	0	0
I-9xx	0	0	0	0	0	0	0	0
I-9xx	0	0	0	0	0	0	0	0
I-9xx	0	0	0	0	0	0	0	0
I-9xx	0	0	0	0	0	0	0	0
I-9xx	0	0	0	0	0	0	0	0
I-9xx	0	0	0	0	0	0	0	0
I-9xx	0	0	0	0	0	0	0	0
Pxxxx	0	0	0	0	0	0	0	0
Pxxxx	0	0	0	0	0	0	0	0
Pxxxx	0	0	0	0	0	0	0	0
Pxxxx	0	0	0	0	0	0	0	0
Pxxxx	0	0	0	0	0	0	0	0
Pxxxx	0	0	0	0	0	0	0	0
PBFUEL	10285	0	-846	9439	0	0	0	9439
PBHDSL	0	0	0	0	0	0	0	0
PCTISO	0	0	0	0	0	0	0	0
PCTTR	23643	0	2868	26511	0	0	0	26511
PDSDSL	64856	0	80009	144865	0	0	0	144865
PDSL	76321	0	88946	165267	0	0	0	165267
PFCCF	0	0	0	0	0	0	0	0
PFCOO	131328	0	-37350	93978	0	0	0	93978
PFDISO	277698	0	-161672	116026	0	0	0	116026
PGABS	0	0	0	0	0	0	0	0
PGPDSL	0	0	0	0	0	0	0	0
PISIMP	0	0	0	0	0	0	0	0
PKERIM	0	0	0	0	0	0	0	0
PKERO	149769	0	-5572	144197	0	0	0	144197
PLANTS	69035	0	0	69035	0	0	0	69035
PLCGAS	60366	0	115403	175769	0	0	0	175769
PLLCN	4913	0	1543	6456	0	0	0	6456
PLSRBS	0	0	0	0	0	0	0	0
PLTISO	76062	0	-25866	50196	0	0	0	50196
PMEISO	49525	0	-9766	39759	0	0	0	39759
PMIDSL	13027	0	-3349	9678	0	0	0	9678
PMSR	22225	0	-3136	19089	0	0	0	19089
POMRSD	0	0	0	0	0	0	0	0
PPOLY	21881	0	9393	31274	0	0	0	31274
PP90R	0	0	0	0	0	0	0	0
PP93R	87363	0	-5867	81496	0	0	0	81496
PP95R	0	0	0	0	0	0	0	0
PP96R	97039	0	24257	121296	0	0	0	121296
PRESID	93352	0	340735	434087	0	0	0	434087
PRESMI	0	0	0	0	0	0	0	0
PRES75	0	0	0	0	0	0	0	0
PSKERO	38953	0	658	39611	0	0	0	39611
PSLOPD	33503	0	-4714	28789	0	0	0	28789
PSLOPO	43973	0	-5518	38455	0	0	0	38455
PSLOPT	0	0	0	0	0	0	0	0
PSMCN	76414	0	-29517	46897	0	0	0	46897
PSWMSR	35746	0	-100	35646	0	0	0	35646
PUFCHG	52473	0	-9419	43054	0	0	0	43054
PUJFBS	0	0	0	0	0	0	0	0
PWCN	2573	0	2999	5572	0	0	0	5572
P440BS	0	0	0	0	0	0	0	0
PROCESS	1612323	0	364119	1976442	0	0	0	1976442
FINISH PRD	3243540	155202	7573197	10971939	6963444	316017	784	3691694
TOTAL	4855863	155202	7937316	12948381	6963444	316017	784	5668136

Screen 5
Continued

GRADE	DESCRIPTION	EQUIVALENCY IN BALANCING GRADES							CHECK
		I-150	I-220	I-210	I-395M	I-440	I-888	I-961	
I-9xx	Fuel Oil	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	1.0000
I-9xx	Fuel Oil	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	1.0000
Pxxxx	Intermediate	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Pxxxx	Intermediate	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Pxxxx	Intermediate	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Pxxxx	Intermediate	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Pxxxx	Intermediate	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Pxxxx	Intermediate	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
PBFUEL	Burner Fuel Oil	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	1.0000
PBHDSL	Diesel Oil ex Bombay High	0.0000	0.0000	0.0000	0.0000	-1.3942	2.3942	0.0000	1.0000
PCTISO	Isomate Cutter	0.0000	0.0000	0.0000	0.0000	0.0000	0.3360	0.6640	1.0000
PCTTR	Cutter Stock	0.0000	0.0000	0.0000	0.0000	0.0000	0.6438	0.3562	1.0000
PDSDSL	Desulfurized Diesel	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000	1.0000
PDSL	Diesl	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000	1.0000
PFCCF	HVGO to FCCU	0.0000	0.0000	0.0000	0.0000	0.0000	0.2406	0.7594	1.0000
PFCCO	Hvy Isomate to FCCU	0.0000	0.0000	0.0000	0.0000	0.0000	0.2697	0.7303	1.0000
PFDISO	HVGO to 2HDU	0.0000	0.0000	0.0000	0.0000	0.0000	0.2406	0.7594	1.0000
PGABS	Gasoline	-0.0914	0.5711	0.0000	0.5343	0.0000	0.0000	0.0000	1.0000
PGPDSL	Diesel ex Gippsland	0.0000	0.0000	0.0000	0.0000	-1.3942	2.3942	0.0000	1.0000
PISIMP	Isomate Import	0.0000	0.0000	0.0000	0.0000	0.0000	0.2918	0.7082	1.0000
PKERIM	Kerosene Import	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000	1.0000
PKERO	Kerosene	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000	0.0000	1.0000
PLANTS	Plants & Lines Contents	0.0103	0.1041	0.1105	0.1518	0.0886	0.1854	0.3494	1.0000
PLCGAS	Lt Cat Naphtha	0.0020	-0.0801	0.0000	1.0781	0.0000	0.0000	0.0000	1.0000
PLLCN	L. Lt Cat Naphtha	0.0020	-0.0801	0.0000	1.0781	0.0000	0.0000	0.0000	1.0000
PLSRBS	I-220 LSR	0.0000	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000
PLTISO	Lt. Isomate	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000	1.0000
PMEISO	Med. Isomate Cutter	0.0000	0.0000	0.0000	0.0000	0.0000	0.3360	0.6640	1.0000
PMIDSL	CDU 4A M/I Diesel	0.0000	0.0000	0.0000	0.0000	-0.4551	1.4551	0.0000	1.0000
PMSR	Sour MSR Naphtha	-0.1140	-0.4690	1.5830	0.0000	0.0000	0.0000	0.0000	1.0000
POMRSD	Oman Resid Import	0.0000	0.0000	0.0000	0.0000	0.0000	0.0245	0.9755	1.0000
PPOLY	Polymer Gasoline	-0.0102	-0.3091	0.0000	1.3193	0.0000	0.0000	0.0000	1.0000
PP90R	90 RON Reformate	-0.0272	-0.0458	0.0000	1.0730	0.0000	0.0000	0.0000	1.0000
PP93R	93 RON Reformate	-0.0246	-0.1503	0.0000	1.1749	0.0000	0.0000	0.0000	1.0000
PP95R	95 RON Reformate	-0.0228	-0.2200	0.0000	1.2428	0.0000	0.0000	0.0000	1.0000
PP96R	96 RON Reformate	-0.0219	-0.2548	0.0000	1.2767	0.0000	0.0000	0.0000	1.0000
PRESID	Residuum	0.0000	0.0000	0.0000	0.0000	0.0000	0.2218	0.7782	1.0000
PRESMI	M/I DsIs in 6VDU Feed	0.0000	0.0000	0.0000	0.0000	-0.4551	1.4551	0.0000	1.0000
PRES75	I-725 in 6VDU Feed	0.0000	0.0000	0.0000	0.0000	0.0000	0.3468	0.6532	1.0000
PSKERO	Sweet Kerosene	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000	0.0000	1.0000
PSLOPD	Slop Distillate	0.0000	0.1000	0.1000	0.1400	0.1900	0.3700	0.1000	1.0000
PSLOPO	Slop Oil	0.0000	0.1000	0.1000	0.1400	0.1900	0.3700	0.1000	1.0000
PSLOPT	Slop ex Marine Terminal	-0.0123	0.1414	0.0000	0.4936	0.0488	0.3285	0.0000	1.0000
PSMCN	Sweet Med. Cat Naphtha	-0.1030	0.0870	0.0000	1.0160	0.0000	0.0000	0.0000	1.0000
PSWMSR	Sweet MSR	-0.1140	-0.4690	1.5830	0.0000	0.0000	0.0000	0.0000	1.0000
PUFCHG	Unifiner Feed	-0.1140	-0.4690	1.5830	0.0000	0.0000	0.0000	0.0000	1.0000
PUJFBS	Sour Jet B.S.	-0.1140	-0.4690	1.5830	0.0000	0.0000	0.0000	0.0000	1.0000
PWCN	Whole Cat Naphtha	-0.0032	0.1255	0.0000	0.8777	0.0000	0.0000	0.0000	1.0000
P440BS	Jet Basestock	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000	0.0000	1.0000
CRUDE	Crude oil	0.0000	0.0100	0.1800	0.0000	0.1000	0.3100	0.4000	1.0000

**Screen 6
Retrospective DOP**

GRADE	PRODUCT	BOC					AOC				
		INITIAL DOP BOC	FORECASTER BOC	F.C COMPENS. CHANGES	CRUDE CHANGES BOC	RETRO DOP BOC	INITIAL DOP AOC	FORECASTER AOC	F.C COMPENS. AOC	CRUDE CHANGES AOC	RETRO DOP AOC
I-1138	Asphalt 60/70	0	0			0	36000	1467			37467
I-1149	Asphalt 40/50	0	352			352	0	528			528
I-11xx	Asphalt	0	0			0	0	0			0
I-11xx	Asphalt	0	0			0	0	0			0
I-150	LPG	0	0	-487	0	-487	24000	0	-690	0	23310
I-151	LPG	0	0			0	0	0			0
I-1xx	LPG	0	0			0	0	0			0
I-1xx	LPG	0	0			0	0	0			0
I-201	LSR Naphtha	0	0			0	0	0			0
I-210	WSR Naphtha	362670	0	5280	-1796	366154	671320	0	-35	2976	674260
I-220	LSR Naphtha	144000	0	-7234	-100	136666	0	0	9192	165	9357
I-2xx	Naphtha	0	0			0	0	0			0
I-2xx	Naphtha	0	0			0	0	0			0
I-2xx	Naphtha	0	0			0	0	0			0
I-2xx	Naphtha	0	0			0	0	0			0
I-253	Whole Cat Naphtha	0	0			0	0	0			0
I-383	Mogas (83 RON, 0.84 Pb)	0	-3147			-3147	0	-5121			-5121
I-387	Mogas (87 RON, 0.84 Pb)	0	11616			11616	0	17423			17423
I-387R	Mogas (87 RON, 0.40 Pb)	0	0			0	0	0			0
I-387S	Mogas	0	0			0	0	0			0
I-390E	Mogas	0	0			0	0	0			0
I-390J	Mogas	0	0			0	105000	35488			140488
I-390R	0.62 Pb	0	0			0	0	0			0
I-390S	Mogas (0.40 Pb, 8 RVP)	0	0			0	0	0			0
I-390X		0	0			0	0	0			0
I-390Z	0.4 Pb, 9 RVP	207990	1056			209046	0	0			0
I-393	Mogas (93 RON, 0.84 Pb)	0	0			0	0	0			0
I-393S	Mogas (93 RON, 0.40 Pb)	0	0			0	0	0			0
I-393X	Mogas (93 RON, 0.60 Pb)	0	0			0	0	0			0
I-395L	Mogas (95 RON, 0.84 Pb)	0	0			0	0	-72896			-72896
I-395LL	Mogas (95 RON, 0.15 Pb)	0	330			330	0	31132			31132

**Screen 6
Continued**

GRADE	PRODUCT	BOC					AOC				
		INITIAL DOP BOC	FORECASTER BOC	F.C COMPENS. CHANGES	CRUDE CHANGES BOC	RETRO DOP BOC	INITIAL DOP AOC	FORECASTER AOC	F.C COMPENS. AOC	CRUDE CHANGES AOC	RETRO DOP AOC
I-395M	Mogas (95 RON, 0.40 Pb)	0	0	3119	0	3119	68400	0	-224064	0	-155664
I-395S	Mogas	0	0			0	0	0			0
I-397	Mogas	0	0			0	0	0			0
I-397C	Mogas (97 RON, 0.6 Pb)	0	0			0	0	0			0
I-397E	Mogas (97 RON, 0.84 Pb)	0	0			0	0	0			0
I-397LL	Mogas (97 RON, 0.15 Pb)	27000	-6950			20050	42000	-28499			13501
I-397R	Mogas (97 RON, 0.4 Pb)	0	0			0	0	0			0
I-397S	Mogas (0.4 Pb, 9 RVP)	0	0			0	0	0			0
I-3975		0	0			0	0	0			0
I-398E	Mogas (98 RON, 0.84 Pb)	0	0			0	0	249558			249558
I-398M	Mogas	0	0			0	57900	88805			146705
I-398S	Mogas (0.4 Pb, 10 RVP)	0	0			0	99990	-99990			0
I-398X	Mogas (98 RON, 0.60 Pb)	0	0			0	0	0			0
I-3xx	Mogas	0	0			0	0	0			0
I-3xx	Mogas	0	0			0	0	0			0
I-3xx	Mogas	0	0			0	0	0			0
I-3xx	Mogas	0	0			0	0	0			0
I-3xx	Mogas	0	0			0	0	0			0
I-3xx	Mogas	0	0			0	0	0			0
I-3xx	Mogas	0	0			0	0	0			0
I-3xx	Mogas	0	0			0	0	0			0
I-3xx	Mogas	0	0			0	0	0			0
I-3xx	Mogas	0	0			0	0	0			0
I-3xx	Mogas	0	0			0	0	0			0
I-3xx	Mogas	0	0			0	0	0			0
I-400	Special Kerosene	0	0			0	0	0			0
I-411	Standard White Kerosene	0	0			0	9000	-9000			0
I-419	Dual Purpose Kerosene	0	0			0	0	0			0
I-434	Jet Fuel JP-4	0	0			0	0	-6			-6
I-440	Jet A-1 Fuel	576000	0	-1705	-998	573297	855000	0	-2509	1653	854144
I-440IM		0	0			0	0	0			0
I-4xx	Kerosene	0	0			0	0	0			0

I-4xx	Kerosene	0	0		0	0	0			0	
I-4xx	Kerosene	0	0		0	0	0			0	
I-4xx	Kerosene	0	0		0	0	0			0	
I-4xx	Kerosene	0	0		0	0	0			0	
I-711	Lube Distillate	0	0		0	0	0			0	
I-725	FCCU Charge Stock	0	0		0	0	0			0	
I-726	L.S. FCCU Charge Stock	0	0		0	0	0			0	
I-730	Arabian Crude HVGO	0	0		0	0	0			0	
I-7xx	Heavy Gasoil	0	0		0	0	0			0	
I-7xx	Heavy Gasoil	0	0		0	0	0			0	
I-7xx	Heavy Gasoil	0	0		0	0	0			0	
I-800	High Speed Diesel	0	0		0	0	0			0	
I-80001	Zero Pour HSD	210000	8786		218786	681000	28492			709492	
I-875	Diesel (47 CI, -6 Pour)	0	0		0	0	0			0	
I-876	Diesel (46 CI, -6 Pour)	0	0		0	204000	116348			320348	
I-876ZP	Diesel (46 CI, -18 Pour)	0	0		0	0	0			0	
I-884	Diesel (47 CI, 0.5 Sulf)	0	0		0	0	0			0	
I-885	Diesel (50 CI, 0.5 Sulf)	24990	-19755		5235	66990	-29720			37270	
I-888	Diesel (50 CI, -3 Pour)	599130	0	-14183	-3094	581853	471930	0	-156782	5125	320272
I-88852		0	0		0	0	0			0	
I-8xx	Diesel	0	0		0	0	0			0	
I-8xx	Diesel	0	0		0	0	0			0	
I-8xx	Diesel	0	0		0	0	0			0	
I-8xx	Diesel	0	0		0	0	0			0	
I-8xx	Diesel	0	0		0	0	0			0	
I-8xx	Diesel	0	0		0	0	0			0	
I-8xx	Diesel	0	0		0	0	0			0	
I-8xx	Diesel	0	0		0	0	0			0	
I-8xx	Diesel	0	0		0	0	0			0	
I-892	Marine Diesel Oil	0	-104		-104	0	-81			-81	
I-928	Fuel Oil (2.8 S, 180 cSt)	0	0		0	0	0			0	
I-933	Fuel Oil (3.5 S, 80 cSt)	0	0		0	0	0			0	
I-955	Fuel Oil (3.5 S, 75 cSt)	0	0		0	0	0			0	
I-957	Fuel Oil (3.5 S, 225 SUS)	0	0		0	0	0			0	
I-960	Fuel Oil (3.5 S, 120 cSt)	0	0		0	0	0			0	
I-96001		0	0		0	0	0			0	
I-9601		0	0		0	0	0			0	
I-9602		0	0		0	0	0			0	
I-961	Fuel Oil (3.5 S, 180 cSt)	724230	0	21759	-3992	741997	582030	0	128013	6612	716655
I-96107	Fuel Oil (4.0 S, 180 cSt)	0	0			0	420990	-129559			291431

**Screen 6
Continued**

GRADE	PRODUCT	BOC					AOC				
		INITIAL DOP BOC	FORECASTER BOC	F.C COMPENS. CHANGES	CRUDE CHANGES BOC	RETRO DOP BOC	INITIAL DOP AOC	FORECASTER AOC	F.C COMPENS. AOC	CRUDE CHANGES AOC	RETRO DOP AOC
I-962	Fuel Oil (3.5 S, 280 cSt)	0	0			0	0	0		0	
I-96201		0	0			0	0	0		0	
I-96202		0	0			0	0	0		0	
I-971	Fuel Oil (4.0 S, 380 cSt)	0	0			0	0	0		0	
I-97103		0	0			0	387990	-6535		381455	
I-9xx	Fuel Oil	0	0			0	0	0		0	
I-9xx	Fuel Oil	0	0			0	0	0		0	
I-9xx	Fuel Oil	0	0			0	0	0		0	
I-9xx	Fuel Oil	0	0			0	0	0		0	
I-9xx	Fuel Oil	0	0			0	0	0		0	
I-9xx	Fuel Oil	0	0			0	0	0		0	
I-9xx	Fuel Oil	0	0			0	0	0		0	
I-9xx	Fuel Oil	0	0			0	0	0		0	
I-9xx	Fuel Oil	0	0			0	0	0		0	
I-9xx	Fuel Oil	0	0			0	0	0		0	
I-9xx	Fuel Oil	0	0			0	0	0		0	
I-9xx	Fuel Oil	0	0			0	0	0		0	
I-9xx	Fuel Oil	0	0			0	0	0		0	
Pxxxx	Intermediate	0	0			0	0	0		0	
Pxxxx	Intermediate	0	0			0	0	0		0	
Pxxxx	Intermediate	0	0			0	0	0		0	
Pxxxx	Intermediate	0	0			0	0	0		0	
Pxxxx	Intermediate	0	0			0	0	0		0	
Pxxxx	Intermediate	0	0			0	0	0		0	
Pxxxx	Intermediate	0	0			0	0	0		0	
PBFUEL	Burner Fuel Oil	0	-255			-255	0	-591		-591	
PBHDSL	Diesel Oil ex Bombay High	0	0			0	0	0		0	
PCTISO	Isomate Cutter	0	0			0	0	0		0	
PCTTR	Cutter Stock	0	0			0	6000	-3132		2868	
PDSDSL	Desulfurized Diesel	0	28404			28404	9000	42605		51605	
PDSL	Diesel	0	29974			29974	14010	44962		58972	
PFCCF	HVGO to FCCU	0	0			0	0	0		0	
PFCCO	Hvy Isomate to FCCU	-30990	11365			-19625	-27990	10265		-17725	
PFDISO	HVGO to 2HDU	-51000	2782			-48218	-120000	6546		-113454	

PGABS	Gasoline	0	0		0	0	0	0		
PGPDSL	Diesel ex Gippsland	0	0		0	0	0	0		
PISIMP	Isomate Import	0	0		0	0	0	0		
PKERIM	Kerosene Import	0	0		0	0	0	0		
PKERO	Kerosene	0	-2391		-2391	0	-3181	-3181		
PLANTS	Plants & Lines Contents	0	0		0	0	0	0		
PLCGAS	Lt Cat Naphtha	33990	4097		38087	69000	8316	77316		
PLLCN	L. Lt Cat Naphtha	0	617		617	0	926	926		
PLSRBS	I-220 LSR	0	0		0	0	0	0		
PLTISO	Lt. Isomate	2010	-7758		-5748	0	-20118	-20118		
PMEISO	Med. Isomate Cutter	0	-4470		-4470	0	-5296	-5296		
PMIDSL	CDU 4A M/I Diesel	6990	-13119		-6129	9990	-7210	2780		
PMSR	Sour MSR Naphtha	0	-1239		-1239	0	-1897	-1897		
POMRSD	Oman Resid Import	0	0		0	0	0	0		
PPOLY	Polymer Gasoline	3990	-577		3413	6990	-1010	5980		
PP90R	90 RON Reformate	0	0		0	0	0	0		
PP93R	93 RON Reformate	-990	-946		-1936	-2010	-1921	-3931		
PP95R	95 RON Reformate	0	0		0	0	0	0		
PP96R	96 RON Reformate	9990	-1332		8658	18000	-2401	15599		
PRESID	Residuum	363960	-37462		326498	15870	-1633	14237		
PRESMI	M/I Dsls in 6VDU Feed	0	0		0	0	0	0		
PRES75	B725 in 6VDU Feed	0	0		0	0	0	0		
PSKERO	Sweet Kerosene	0	263		263	0	395	395		
PSLOPD	Slop Distillate	0	-1860		-1860	0	-2854	-2854		
PSLOPO	Slop Oil	0	-1901		-1901	0	-3617	-3617		
PSLOPT	Slop ex Marine Terminal	0	0		0	0	0	0		
PSMCN	Sweet Med. Cat Naphtha	-8010	-2265		-10275	-15000	-4242	-19242		
PSWMSR	Sweet MSR	0	0		0	-6000	5900	-100		
PUFCHG	Unifiner Feed	-3990	-1859		-5849	0	-3570	-3570		
PUJFBS	Sour Jet B.S.	0	0		0	0	0	0		
PWCN	Whole Cat Naphtha	0	1200		1200	0	1799	1799		
P440BS	Jet B.S.	0	0		0	0	0	0		
	COLUMN SUM	3201960	-6548	6548	-9980	3191980	4761400	246875	-246875	4777931
CRUDE		3225000			-9980	3215020	4806000		16531	4822531
	FINISHED PRD.	2876010					4783540			
	PROCESS STOCKS	325950					-22140			
	PRD + PROCESS STOCKS	3201960								
LOSSES		23040				23040				44600

I-398M	0	0	0	0	0	0	0	0
I-398S	0	0	0	0	0	0	0	0
I-398X	0	0	0	0	0	0	0	0
I-3xx	0	0	0	0	0	0	0	0
I-3xx	0	0	0	0	0	0	0	0
I-3xx	0	0	0	0	0	0	0	0
I-3xx	0	0	0	0	0	0	0	0
I-3xx	0	0	0	0	0	0	0	0
I-3xx	0	0	0	0	0	0	0	0
I-3xx	0	0	0	0	0	0	0	0
I-3xx	0	0	0	0	0	0	0	0
I-3xx	0	0	0	0	0	0	0	0
I-3xx	0	0	0	0	0	0	0	0
I-3xx	0	0	0	0	0	0	0	0
I-400	0	0	0	0	0	0	0	0
I-411	0	0	0	0	0	0	0	0
I-419	0	0	0	0	0	0	0	0
I-434	0	0	0	0	0	0	0	0
I-440	573297	0	0	0	0	573297	0	0
I-440IM	0	0	0	0	0	0	0	0
I-4xx	0	0	0	0	0	0	0	0
I-4xx	0	0	0	0	0	0	0	0
I-4xx	0	0	0	0	0	0	0	0
I-4xx	0	0	0	0	0	0	0	0
I-4xx	0	0	0	0	0	0	0	0
I-711	0	0	0	0	0	0	0	0
I-725	0	0	0	0	0	0	0	0
I-726	0	0	0	0	0	0	0	0
I-730	0	0	0	0	0	0	0	0
I-7xx	0	0	0	0	0	0	0	0
I-7xx	0	0	0	0	0	0	0	0
I-7xx	0	0	0	0	0	0	0	0
I-800	0	0	0	0	0	0	0	0
I-80001	218786	0	0	0	0	-35421	254207	0
I-875	0	0	0	0	0	0	0	0
I-876	0	0	0	0	0	0	0	0
I-876ZP	0	0	0	0	0	0	0	0
I-884	0	0	0	0	0	0	0	0
I-885	5235	0	0	0	0	0	5235	0
I-888	581853	0	0	0	0	0	581853	0
I-88852	0	0	0	0	0	0	0	0
I-8xx	0	0	0	0	0	0	0	0
I-8xx	0	0	0	0	0	0	0	0
I-8xx	0	0	0	0	0	0	0	0
I-8xx	0	0	0	0	0	0	0	0
I-8xx	0	0	0	0	0	0	0	0
I-8xx	0	0	0	0	0	0	0	0
I-8xx	0	0	0	0	0	0	0	0
I-8xx	0	0	0	0	0	0	0	0
I-892	-104	0	0	0	0	0	-76	-28

PGPDSL	0	0	0	0	0	0	0	0
PISIMP	0	0	0	0	0	0	0	0
PKERIM	0	0	0	0	0	0	0	0
PKERO	-2391	0	0	0	0	-2391	0	0
PLANTS	0	0	0	0	0	0	0	0
PLCGAS	38087	76	-3051	0	41062	0	0	0
PLLCN	617	1	-49	0	665	0	0	0
PLSRBS	0	0	0	0	0	0	0	0
PLTISO	-5748	0	0	0	0	0	-5748	0
PMEISO	-4470	0	0	0	0	0	-1502	-2968
PMIDSL	-6129	0	0	0	0	2789	-8918	0
PMSR	-1239	141	581	-1961	0	0	0	0
POMRSD	0	0	0	0	0	0	0	0
PPOLY	3413	-35	-1055	0	4503	0	0	0
PP90R	0	0	0	0	0	0	0	0
PP93R	-1936	48	291	0	-2275	0	0	0
PP95R	0	0	0	0	0	0	0	0
PP96R	8658	-190	-2206	0	11054	0	0	0
PRESID	326498	0	0	0	0	0	72417	254081
PRESMI	0	0	0	0	0	0	0	0
PRES75	0	0	0	0	0	0	0	0
PSKERO	263	0	0	0	0	263	0	0
PSLOPD	-1860	0	-186	-186	-260	-353	-688	-186
PSLOPO	-1901	0	-190	-190	-266	-361	-703	-190
PSLOPT	0	0	0	0	0	0	0	0
PSMCN	-10275	1058	-894	0	-10439	0	0	0
PSWMSR	0	0	0	0	0	0	0	0
PUFCHG	-5849	667	2743	-9259	0	0	0	0
PUJFBS	0	0	0	0	0	0	0	0
PWCN	1200	-4	151	0	1053	0	0	0
P440BS	0	0	0	0	0	0	0	0
COL SUM	3191980	-2997.95	188052.6	354557.4	235131.8	537821.9	937304.1	942110.3

It would have been impossible to incorporate all this kerosene dumping into diesel in Participant BOC's LP model, as all the diesels were close to their flash point limit.

USE OF POUR POINT DEPRESSANTS

While processing certain waxy crudes, it is common practice to add pour point depressants to diesel produced to prevent or minimize kerosene dumping into diesel.

For example, kerosene from Bombay high crude may have a pour point of +9°C. Therefore, a significant amount of kerosene might be required

**Screen 8
Continued**

GRADE	RETRO	BALANCING GRADES EQUIVALENTS						
	DOP	I-150	I-220	I-210	I-395M	I-440	I-888	I-961
I-8xx	0	0	0	0	0	0	0	0
I-8xx	0	0	0	0	0	0	0	0
I-8xx	0	0	0	0	0	0	0	0
I-8xx	0	0	0	0	0	0	0	0
I-892	-81	0	0	0	0	0	-59	-22
I-928	0	0	0	0	0	0	0	0
I-933	0	0	0	0	0	0	0	0
I-955	0	0	0	0	0	0	0	0
I-957	0	0	0	0	0	0	0	0
I-960	0	0	0	0	0	0	0	0
I-96001	0	0	0	0	0	0	0	0
I-9601	0	0	0	0	0	0	0	0
I-9602	0	0	0	0	0	0	0	0
I-961	716655	0	0	0	0	0	0	716655
I-96107	291431	0	0	0	0	0	0	291431
I-962	0	0	0	0	0	0	0	0
I-96201	0	0	0	0	0	0	0	0
I-96202	0	0	0	0	0	0	0	0
I-971	0	0	0	0	0	0	0	0
I-97103	381455	0	0	0	0	0	-39252	420707
I-9xx	0	0	0	0	0	0	0	0
I-9xx	0	0	0	0	0	0	0	0
I-9xx	0	0	0	0	0	0	0	0
I-9xx	0	0	0	0	0	0	0	0
I-9xx	0	0	0	0	0	0	0	0
I-9xx	0	0	0	0	0	0	0	0
I-9xx	0	0	0	0	0	0	0	0
I-9xx	0	0	0	0	0	0	0	0
I-9xx	0	0	0	0	0	0	0	0
I-9xx	0	0	0	0	0	0	0	0
I-9xx	0	0	0	0	0	0	0	0
I-9xx	0	0	0	0	0	0	0	0
Pxxxx	0	0	0	0	0	0	0	0
Pxxxx	0	0	0	0	0	0	0	0
Pxxxx	0	0	0	0	0	0	0	0
Pxxxx	0	0	0	0	0	0	0	0
Pxxxx	0	0	0	0	0	0	0	0
Pxxxx	0	0	0	0	0	0	0	0
PBFUEL	-591	0	0	0	0	0	0	-591
PBHDSL	0	0	0	0	0	0	0	0
PCTISO	0	0	0	0	0	0	0	0
PCTTR	2868	0	0	0	0	0	1846	1022

PDSDSL	51605	0	0	0	0	0	51605	0
PDSL	58972	0	0	0	0	0	58972	0
PFCCF	0	0	0	0	0	0	0	0
PFCCO	-17725	0	0	0	0	0	-4780	-12945
PFDISO	-113454	0	0	0	0	0	-27297	-86157
PGABS	0	0	0	0	0	0	0	0
PGPDSL	0	0	0	0	0	0	0	0
PISIMP	0	0	0	0	0	0	0	0
PKERIM	0	0	0	0	0	0	0	0
PKERO	-3181	0	0	0	0	-3181	0	0
PLANTS	0	0	0	0	0	0	0	0
PLCGAS	77316	155	-6193	0	83354	0	0	0
PLLCN	926	2	-74	0	998	0	0	0
PLSRBS	0	0	0	0	0	0	0	0
PLTISO	-20118	0	0	0	0	0	-20118	0
PMEISO	-5296	0	0	0	0	0	-1779	-3517
PMIDSL	2780	0	0	0	0	-1265	4045	0
PMSR	-1897	216	890	-3003	0	0	0	0
POMRSD	0	0	0	0	0	0	0	0
PPOLY	5980	-61	-1848	0	7889	0	0	0
PP90R	0	0	0	0	0	0	0	0
PP93R	-3931	97	591	0	-4619	0	0	0
PP95R	0	0	0	0	0	0	0	0
PP96R	15599	-342	-3975	0	19915	0	0	0
PRESID	14237	0	0	0	0	0	3158	11079
PRESMI	0	0	0	0	0	0	0	0
PRES75	0	0	0	0	0	0	0	0
PSKERO	395	0	0	0	0	395	0	0
PSLOPD	-2854	0	-285	-285	-400	-542	-1056	-285
PSLOPO	-3617	0	-362	-362	-506	-687	-1338	-362
PSLOPT	0	0	0	0	0	0	0	0
PSMCN	-19242	1982	-1674	0	-19550	0	0	0
PSWMSR	-100	11	47	-158	0	0	0	0
PUFCHG	-3570	407	1674	-5651	0	0	0	0
PUJFBS	0	0	0	0	0	0	0	0
PWCN	1799	-6	226	0	1579	0	0	0
P440BS	0	0	0	0	0	0	0	0
COL SUM	4777931	26145	-15753	664798	467541	780412	1452090	1402698

to meet the usual pour requirement of -3 to -6°C . The addition of a pour point depressant in the ppm range lowers the pour point of diesel by 3 – 6°C , reducing the kerosene dumping into diesel.

Screen 9
Allocation of Balancing Grades

BALANCING GRADES COL NO	RETRO DOP EXPRESSED IN BALANCING GRADES		RETRO DOP			REFINERY PRODUCTION (6)	TOTAL DELTA (7)	DELTA BOC (8)	DELTA 1 AOC (9)	REVERSE DELTA		ALLOCATION BOC (12)	ALLOCATION AOC (13)
	DOP BOC (1)	DOP AOC (2)	DOP BOC (3)	DOP AOC (4)	DOP TOTAL (5)					BOC (10)	AOC (11)		
I-150	-2998	26145	-487	23310	22823	23160	337	-44	381	-12	12	-543	23703
I-220	188053	-15753	136666	9357	146024	198553	52529	57332	-4803	-1926	1926	192072	6481
I-210	354557	664798	366154	674260	1040414	800332	-240082	-83507	-156576	-8801	8801	273846	526486
I-395M	235132	467541	3119	-155664	-152545	0	152545	51045	101500	-5592	5592	48572	-48572
I-440	537822	780412	573297	854144	1427441	1476919	49478	20186	29292	-1814	1814	591669	885250
I-888	937304	1452090	581853	320272	902125	1095206	193081	75741	117340	-7078	7078	650516	444690
I-961	942110	1402698	741997	716655	1458652	1218169	-240483	-96623	-143861	-8816	8816	636558	581611
LOSSES	23040	44600	23040	44600	67640	100235	32595	11103	21492	-1195	1195	32948	67287
TOTAL							0	35234	-35234	-35234	35234		
ABSOLUTE SUM OF COMBINED TOTAL DELTAS (COLUMN 7) =							961131						

Screen 10
Allocated Production

GRADE	PRODUCT	BOC ALLOCATION	AOC ALLOCATION	TOTAL PRODUCED
I-1138	Asphalt 60/70	0	37467	37467
I-1149	Asphalt 40/50	352	528	880
I-1138D	Asphalt	0	0	0
I-11xx	Asphalt	0	0	0
I-150	LPG	-543	23703	23160
I-151	LPG	0	0	0
I-1xx	LPG	0	0	0
I-1xx	LPG	0	0	0
I-201	LSR Naphtha	0	0	0
I-210	WSR Naphtha	273846	526486	800332
I-220	LSR Naphtha	192072	6481	198553
I-2xx	Naphtha	0	0	0
I-2xx	Naphtha	0	0	0
I-2xx	Naphtha	0	0	0
I-2xx	Naphtha	0	0	0
I-253	Whole Cat Naphtha	0	0	0
I-383	Mogas (83 RON, 0.84 Pb)	-3147	-5121	-8268
I-387	Mogas (87 RON, 0.84 Pb)	11616	17423	29039
I-387R	Mogas (87 RON, 0.40 Pb)	0	0	0
I-387S	Mogas 87 RON	0	0	0
I-390E	Mogas 90 RON	0	0	0
I-390J	Mogas	0	140488	140488
I-390R	Mogas	0	0	0
I-390S	Mogas (0.40 Pb, 8 RVP)	0	0	0
I-390X	Mogas	0	0	0
I-390Z	0.4 Pb, 9 RVP	209046	0	209046
I-393	Mogas (93 RON, 0.84 Pb)	0	0	0
I-393S	Mogas (93 RON, 0.40 Pb)	0	0	0
I-393X	Mogas (93 RON, 0.60 Pb)	0	0	0
I-395L	Mogas (95 RON, 0.84 Pb)	0	-72896	-72896
I-395LL	Mogas (95 RON, 0.15 Pb)	330	31132	31462
I-395M	Mogas (95 RON, 0.40 Pb)	48572	-48572	0
I-395S	Mogas	0	0	0
I-397	Mogas	0	0	0
I-397C	Mogas (97 RON, 0.6 Pb)	0	0	0
I-397E	Mogas (97 RON, 0.84 Pb)	0	0	0
I-397LL	Mogas (97 RON, 0.15 Pb)	20050	13501	33551
I-397R	Mogas (97 RON, 0.4 Pb)	0	0	0
I-397S	Mogas (0.4 Pb, 9 RVP)	0	0	0
I-3975	Mogas	0	0	0
I-398E	Mogas (98 RON, 0.84 Pb)	0	249558	249558

**Screen 10
Continued**

GRADE	PRODUCT	BOC ALLOCATION	AOC ALLOCATION	TOTAL PRODUCED
I-398M	Mogas	0	146705	146705
I-398S	Mogas (0.4 Pb, 10 RVP)	0	0	0
I-398X	Mogas (98 RON, 0.60 Pb)	0	0	0
I-3xx	Mogas	0	0	0
I-3xx	Mogas	0	0	0
I-3xx	Mogas	0	0	0
I-3xx	Mogas	0	0	0
I-3xx	Mogas	0	0	0
I-3xx	Mogas	0	0	0
I-3xx	Mogas	0	0	0
I-3xx	Mogas	0	0	0
I-3xx	Mogas	0	0	0
I-3xx	Mogas	0	0	0
I-400	Special Kerosene	0	0	0
I-411	Standard White Kerosene	0	0	0
I-419	Dual Purpose Kerosene	0	0	0
I-434	Jet Fuel JP-4	0	-6	-6
I-440	Jet A-1 Fuel	591669	885250	1476919
I-440IM		0	0	0
I-4xx	Kerosene	0	0	0
I-4xx	Kerosene	0	0	0
I-4xx	Kerosene	0	0	0
I-4xx	Kerosene	0	0	0
I-4xx	Kerosene	0	0	0
I-711	Lube Distillate	0	0	0
I-725	FCCU Charge Stock	0	0	0
I-726	L.S. FCCU Charge Stock	0	0	0
I-730	Arabian Crude HVGO	0	0	0
I-7xx	Heavy Gasoil	0	0	0
I-7xx	Heavy Gasoil	0	0	0
I-7xx	Heavy Gasoil	0	0	0
I-800	High Speed Diesel	0	0	0
I-80001	Zero Pour HSD	218786	709492	928278
I-875	Diesel (47 CI, -6 Pour)	0	0	0
I-876	Diesel (46 CI, -6 Pour)	0	320348	320348
I-876ZP	Diesel (46 CI, -18 Pour)	0	0	0
I-884	Diesel (47 CI, 0.5 Sulf)	0	0	0
I-885	Diesel (50 CI, 0.5 Sulf)	5235	37270	42505
I-888	Diesel (50 CI, -3 Pour)	650516	444690	1095206
I-88852	Diesel	0	0	0
I-8xx	Diesel	0	0	0

I-8xx	Diesel	0	0	0
I-8xx	Diesel	0	0	0
I-8xx	Diesel	0	0	0
I-8xx	Diesel	0	0	0
I-8xx	Diesel	0	0	0
I-8xx	Diesel	0	0	0
I-8xx	Diesel	0	0	0
I-892	Marine Diesel Oil	-104	-81	-185
I-928	Fuel Oil (2.8 S, 180 cSt)	0	0	0
I-933	Fuel Oil (3.5 S, 80 cSt)	0	0	0
I-955	Fuel Oil (3.5 S, 75 cSt)	0	0	0
I-957	Fuel Oil (3.5 S, 225 SUS)	0	0	0
I-960	Fuel Oil (3.5 S, 120 cSt)	0	0	0
I-96001		0	0	0
I-9601		0	0	0
I-9602		0	0	0
I-961	Fuel Oil (3.5 S, 180 cSt)	636558	581611	1218169
I-96107	Fuel Oil (4.0 S, 180 cSt)	0	291431	291431
I-962	Fuel Oil (3.5 S, 280 cSt)	0	0	0
I-96201		0	0	0
I-96202		0	0	0
I-971	Fuel Oil (4.0 S, 380 cSt)	0	0	0
I-97103		0	381455	381455
I-9xx	Fuel Oil	0	0	0
I-9xx	Fuel Oil	0	0	0
I-9xx	Fuel Oil	0	0	0
I-9xx	Fuel Oil	0	0	0
I-9xx	Fuel Oil	0	0	0
I-9xx	Fuel Oil	0	0	0
I-9xx	Fuel Oil	0	0	0
I-9xx	Fuel Oil	0	0	0
I-9xx	Fuel Oil	0	0	0
I-9xx	Fuel Oil	0	0	0
Pxxxx	Intermediate	0	0	0
Pxxxx	Intermediate	0	0	0
Pxxxx	Intermediate	0	0	0
Pxxxx	Intermediate	0	0	0
Pxxxx	Intermediate	0	0	0
Pxxxx	Intermediate	0	0	0
PBFUEL	Burner Fuel Oil	-255	-591	-846
PBHDSL	Diesel Oil ex Bombay High	0	0	0
PCTISO	Isomate Cutter	0	0	0
PCTTR	Cutter Stock	0	2868	2868
PDSDSL	Desulfurized Diesel	28404	51605	80009
PDSL	Diesel	29974	58972	88946
PFCCF	HVGO to FCCU	0	0	0

Screen 10
Allocated Production

GRADE	PRODUCT	BOC ALLOCATION	AOC ALLOCATION	TOTAL PRODUCED
PFCOO	Hvy Isomate to FCCU	-19625	-17725	-37350
PFDISO	HVGO to 2HDU	-48218	-113454	-161672
PGABS	Gasoline	0	0	0
PGPDSL	Diesel ex Gippsland	0	0	0
PISIMP	Isomate Import	0	0	0
PKERIM	Kerosene Import	0	0	0
PKERO	Kerosene	-2391	-3181	-5572
PLANTS	Plants & Lines Contents	0	0	0
PLCGAS	Lt Cat Naphtha	38087	77316	115403
PLLCN	L. Lt Cat Naphtha	617	926	1543
PLSRBS	B-220 LSR	0	0	0
PLTISO	Lt. Isomate	-5748	-20118	-25866
PMEISO	Med. Isomate Cutter	-4470	-5296	-9766
PMIDSL	CDU 4A M/I Diesel	-6129	2780	-3349
PMSR	Sour MSR Naphtha	-1239	-1897	-3136
POMRSD	Oman Resid Import	0	0	0
PPOLY	Polymer Gasoline	3413	5980	9393
PP90R	90 RON Reformate	0	0	0
PP93R	93 RON Reformate	-1936	-3931	-5867
PP95R	95 RON Reformate	0	0	0
PP96R	96 RON Reformate	8658	15599	24257
PRESID	Residuum	326498	14237	340735
PRESMI	M/I Dsls in 6VDU Feed	0	0	0
PRES75	B725 in 6VDU Feed	0	0	0
PSKERO	Sweet Kerosene	263	395	658
PSLOPD	Slop Distillate	-1860	-2854	-4714
PSLOPO	Slop Oil	-1901	-3617	-5518
PSLOPT	Slop ex Marine Terminal	0	0	0
PSMCN	Sweet Med. Cat Naphtha	-10275	-19242	-29517
PSWMSR	Sweet MSR	0	-100	-100
PUFCHG	Unifiner Feed	-5849	-3570	-9419
PUJFBS	Sour Jet B.S.	0	0	0
PWCN	Whole Cat Naphtha	1200	1799	2999
P440BS	Jet Fuel Base Stock	0	0	0
LOSS		32948	67287	100235
	TOTAL	3215020	4822531	8037551
CRUDE		3215020	4822531	8037551

The following procedure is adopted in the allocation calculations:

1. Estimate the amount of diesel produced during the month.
2. Determine, from the refinery records, the quantity of pour point depressant actually blended during the month.
3. Estimate the pour point dosage actually used.
4. The pour point lowering actually achieved by the preceding pour point dosage is next determined using the correlation between pour point depressant dosage and pour point actually lowered.

The pour point of the diesel with pour point depressant should be used in the allocation LPs. For example, if a diesel pour point without additive is $+9^{\circ}\text{C}$ and the addition of 120 ppm pour point depressant lowers the pour point to 6°C , then the lowered pour point of 6°C or the corresponding pour index should be used in the Bombay high diesel properties, to blend the diesel to the required pour point specification.

“IN TANK” SALE AND PURCHASE BETWEEN THE PARTICIPANTS

Sale of products from one partner to another is referred to as *in-tank sales*, since no physical movement of the product is called for. Adjustment is done to the opening inventories of both participants to reflect the transaction.

EXAMPLE 16-8

Participant AOC has agreed to sell 50 mb of RON 97 gasoline (I-397) to participant BOC during the month. This transaction is reflected in the allocation report of the month, as follows.

For participant AOC, the opening Inventory of I-397 is adjusted by $-50,000$ bbl by entering this figure in the “adjust” column. For participant BOC, the opening Inventory of I-397 is adjusted by $+50,000$ bbl by entering this figure in the “adjust” column. The overall result of these entries would be that AOC’s closing inventory of I-397 decreases by $50,000$ bbl and that of BOC increases by $50,000$ bbl.

REBLENDING FINISHED PRODUCTS

Minor reprocessing and reblending of stocks is also reflected in the inventories tables as adjustments, as shown by the following examples.

1. AOC reprocessed 62,247 bbl of I-434 (jet fuel) during a month, as reflected in the "adjustment" column of the inventory table, on the basis of I-434 equivalency:

GRADE	ADJUSTMENT, bbl
I-434	-62247
I-150	-2179
I-201	32555
I-440	31871
TOTAL	62247

2. Participant BOC transferred 1375 barrels of asphalt (I-1138D) from leaking drums to an asphalt tank (I-1138B), as reflected in the inventory table as follows:

GRADE	ADJUSTMENT, bbl
I-1138D	-1375
I-1138B	1375
TOTAL	0

ALLOCATION OF SULFUR

Allocation of sulfur follows the general principles of allocation. At the end of the month, the figures for actual production of sulfur are available. This is split in the ratio of LP production of sulfur in the final allocation LPs of the participants.

EXAMPLE 16-9

The total sulfur production processing of 200 mbpcd light Arabian crude and 45 mbpcd Arabian medium crude is 5200 tons during a month.

AOC's allocation LP shows a sulfur production of 4500 tons and BOC's allocation LP estimates sulfur production at 1700 tons. The actual sulfur production is 5200 tons.

The actual sulfur production is allocated in the ratio of sulfur production in the participants' allocation LPs as follows:

	Tons/Month	Weight %
AOC LP sulfur production	4500	72.58
BOC LP sulfur production	1700	27.42
Total LP estimate	6200	100.00
Actual refinery sulfur production	5200	
AOC sulfur allocation	3774	
BOC sulfur allocation	1426	

ALLOCATION OF REFINERY FUEL CONSUMPTION

Many refineries burn natural gas as fuel, apart from the off gases produced by the processing units. The refinery purchase of natural gas from outside sources and the actual consumption of gas must be allocated to the participants in the ratio of their actual usage of the gas.

Consumption of purchased gas can be split into two parts: base load consumption and process unit consumption.

- The base load consumption represents the energy demand when all the process units are temporarily shutdown. It is the energy demand from off-site (utilities generation, storage tanks, etc.) and other miscellaneous usage (marine terminal consumption, lighting for refinery and offices, etc.).
- Process unit consumption is the fuel used in the fired heaters of the processing units, or as a feedstock for hydrogen production.

The actual refinery consumption of natural gas is allocated to the participants in the following manner:

1. The total base load of the refinery is known from the historical data, and it is assumed to remain constant. It is unaffected by the refinery crude run. This base load consumption is allocated to the participant in the ratio of its crude run.

2. The processing unit gas consumption for a participant is known from its allocation LP.
3. The sum of these two gives the estimated gas consumption of a participant.
4. The actual refinery gas consumption is allocated to the participant in the ratio of the participants gas consumption as estimated in Step 3.

An example of the gas allocation follows:

EXAMPLE 16-10

Estimate the natural gas allocation for a joint ownership refinery between its two participants AOC and BOC. During the month in question, net natural gas import was 2738 million standard cubic feet. The refinery has an average base load demand of 1023 million standard cubic feet. The crude run of the two participants during the month was 84.26 and 15.74% of the total crude run.

PARTICIPANT	CRUDE RATIO, (1)	LP GAS IMPORT, mmscf (2)	BASE LOAD, mmscf (3)	BASE LOAD+LP, mmscf (4)	REFINERY GAS IMPORTS, mmscf (5)	GAS ALLOCATION, mmscf (6)
AOC	0.8426	1907	862	2769		2204
BOC	0.1574	510	161	671		534
TOTAL	1.0000	2417	1023	3440	2738	2738

Here, the refinery base load is split between the participants in the ratio of their crude run (column 3). Allocation LPs gas imports of the participants is shown in column 2. Actual refinery gas consumption is allocated to the participants in the ratio of their (LP + base load) estimate, as per column 4.

EXAMPLE 16-11, SIMULATION OF REDUCTION IN A CONVERSION UNIT SEVERITY

During the processing of a waxy crude, the mild hydrocracker unit severity was reduced, for 8 days, by lowering the feed reactor inlet temperature by 10°F. The normal unit operating data follows:

	LV%	bpcd
FEED	1.0000	50,000
PRODUCTS		
NAPHTHA	0.0170	
KEROSENE	0.0014	
DIESEL	0.2700	
HVGO	0.7116	

The objective is to reflect this change in the participants' allocation.

The net result of a drop in reactor temperature is that conversion of HVGO feed to diesel is reduced. Here, we first estimate the total loss in diesel barrels during the unit's 8 days operation at reduced severity.

As per the catalyst supplier's manual, the change in conversion with a drop in reactor inlet temperature is as follows:

REACTOR TEMPERATURE, °F	CONVERSION LV%
730	27.0
725	24.5
715	19.0

The loss in diesel yield is, by interpolation of these data, estimated at 5.25% by volume.

$$\begin{aligned} \text{Potential diesel lost to fuel oil} &= 50,000 \times 0.0525 \times 8 \\ &= 21,000 \text{ bbl} \end{aligned}$$

This diesel loss to fuel oil is simulated in the allocation LPs of the participants as follows. The diesel lost to fuel oil is split in the ratio of the equity of the participants:

PARTICIPANT	EQUITY RATIO	DIESEL LOSS, bbl
AOC	0.6000	12600
BOC	0.4000	8400
TOTAL	1.0000	21000

In the allocation LPs of the participants, the following amounts of diesel from the mild hydrocracker unit is forced into balancing-grade fuel oil (I-961):

$$\begin{aligned} \text{AOC} &= 12600/30 \\ &= 420 \text{ bbl/day} \\ \text{BOC} &= 8400/30 \\ &= 280 \text{ bbl/day} \end{aligned}$$

The Allocation LPs are run again to simulate this diesel dumping into fuel oil.

ELIMINATION OF NEGATIVE INVENTORY

By the very nature of allocation procedures, it has been found that, in certain product grades, the participants develop negative inventories, particularly, in the those products whose total physical inventory in the refinery is zero and those produced or sold very infrequently by the respective participant.

We want to bring product allocation book inventories in line with the physical inventories. This cleanup facilitates the accounting inventories by eliminating long-outstanding static balances and correcting inconsistencies.

Mechanism of Adjustment

Consider a fixed-grade product, say, I-211 (naphtha) for which the inventory situation is as follows:

PARTICIPANT	INVENTORY, bbl	REFINERY PHYSICAL INVENTORY, bbl
AOC	43691	
BOC	-43691	
TOTAL	0	0

This implies that participant BOC has overlifted 43,691 bbl of I-211, which actually belonged to AOC.

To eliminate the negative inventory of BOC, AOC gives BOC, 43,961 bbl of I-211. After this transfer, the situation is as follows:

PARTICIPANT	INVENTORY, bbl	ADJUSTMENT, bbl	AFTER ADJUSTMENT, bbl
AOC	43691	-43691	0
BOC	-43691	43691	0
TOTAL	0		0

As AOC has given 43,691 bbl of grade I-211 to BOC, it must receive from BOC an equivalent volume of balancing-grade products, based on product equivalency of I-211.

The product equivalency of I-211 is as follows:

$$I-211 = 1.0000$$

$$I-150 = 0.0245$$

$$I-201 = -0.3110$$

$$I-210 = 1.2865$$

Thus, the balancing grades are adjusted as follows:

PARTICIPANT	I-150, bbl	I-201, bbl	I-210, bbl
AOC	1070	-13588	56208
BOC	-1070	13588	-56208

This procedure is repeated for all fixed grade products to eliminate their negative inventories.

Sometimes, it is possible to eliminate the negative inventories of a participant for a particular grade by offsetting against those of some other grade in the same product group. This is possible only if the equivalency of all grades under consideration is identical as shown next. Consider participants AOC and BOC's asphalt grade inventories, in barrels, as follows.

The equivalency of all product grades (asphalt) is identical.

INVENTORY			
GRADE	AOC	BOC	REFINERY, PHYSICAL
I-1129D	-14857	16710	1853
I-1138D	10199	15808	26007
I-1149D	4697	-4697	0
TOTAL	39	27821	27860

1. Consider that AOC buys 14,857 bbl grade I-1129D from BOC. After this transaction, I-1129D inventories become as follows:

$$\text{AOC} = 0$$

$$\text{BOC} = 1853 \text{ bbl}$$

$$\text{Physical} = 1853 \text{ bbl}$$

2. Now BOC buys 4697 bbls of I-1149D from AOC to offset its negative inventory. After this, I-1149D inventories become as follows:

$$\text{AOC} = 0$$

$$\text{BOC} = 0$$

$$\text{Physical} = 0$$

3. BOC buys another 10,160 bbl of grade I-1138D from AOC. This makes the sale and purchases of both participants exactly equal to each other; that is, 14,857 bbl. The effect on the inventory of I-1138D is as follows:

$$\text{AOC} = 39 \text{ bbl}$$

$$\text{BOC} = 25,968 \text{ bbl}$$

$$\text{Physical} = 26,007 \text{ bbl}$$

Thus, we have eliminated negative inventories of I-1129D and I-1149D, and the position of inventories is as follows:

GRADE	AOC, bbl	BOC, bbl	PHYSICAL, bbl
I-1129D	0	1853	1853
I-1138D	39	25968	26007
I-1149D	0	0	0
TOTAL	39	27821	27860

There is no change in the participants' overall asphalt inventories as a result of elimination of negative inventories.

Balancing-Grade Products

The balancing-grade products generally do not develop negative inventories, as both participants regularly produce these grades. In some rare instances, a particular balancing grade may develop negative inventory if one participant chooses not to produce that particular grade. The solution is either to change the balancing grade or effect an "in-tank" sale or purchase of the product from the other participant, who has positive inventory of that grade. For example, consider the inventory position of the participants, for balancing-grade naphtha I-201, as follows:

$$\text{AOC} = -25,000 \text{ bbl}$$

$$\text{BOC} = 80,000 \text{ bbl}$$

$$\text{Total} = 55,000 \text{ bbl}$$

AOC's negative inventory can be eliminated by an "in-tank" sale of 25,000 bbl I-201 from BOC, after which the position becomes as follows:

$$\text{AOC} = 0$$

$$\text{BOC} = 55,000 \text{ bbl}$$

$$\text{Total} = 55,000 \text{ bbl}$$