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Reducing Fuel Use with an Improved Transit Fuel Planner

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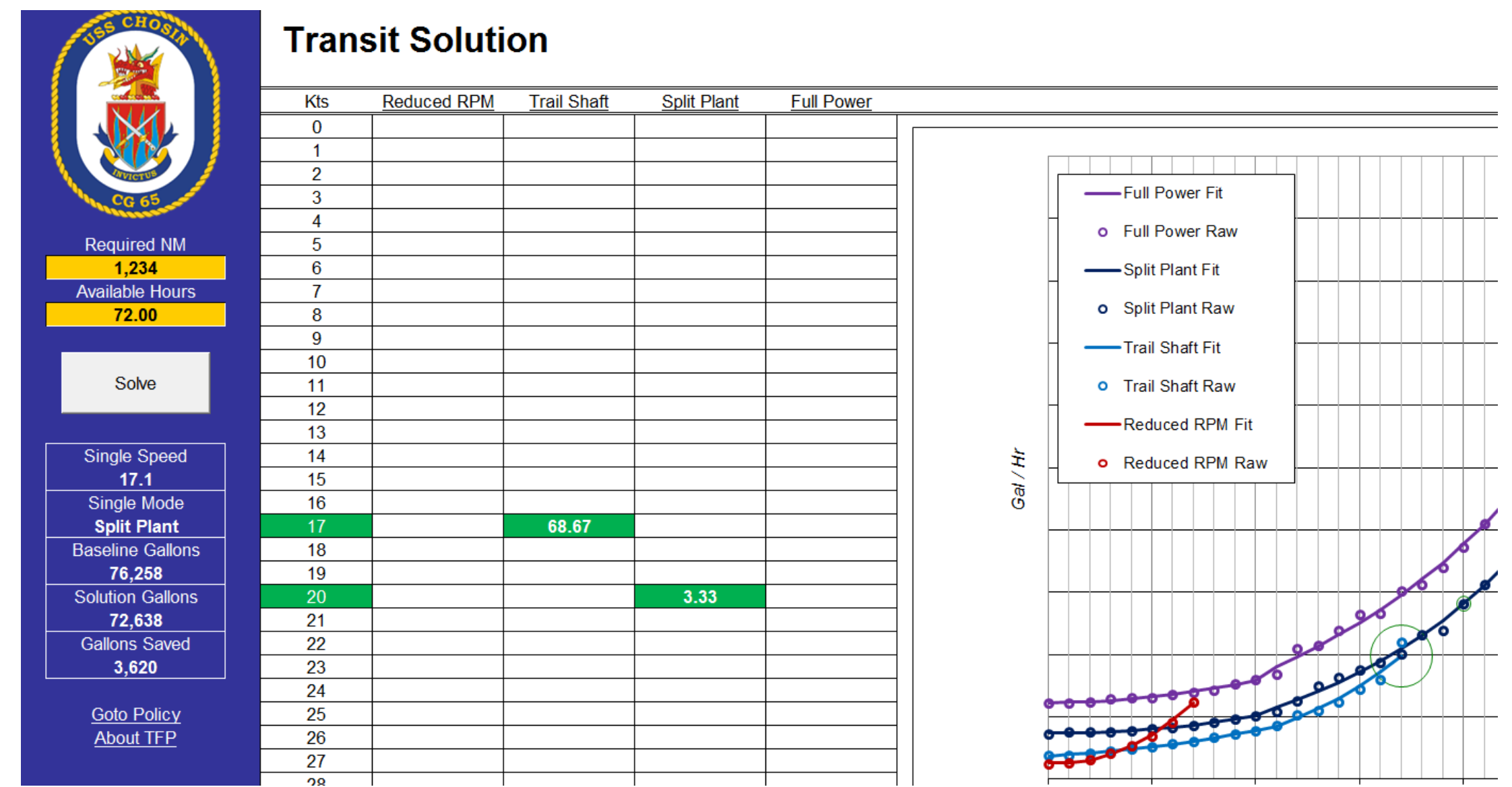
Reducing Fuel Use with an Improved Transit Fuel Planner



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Mixed-Mode Fuel Savings

- Brown, Kline, Rosenthal, and Washburn of NPS created the original Transit Fuel Planner (TFP) in 2008, a tool that helped Cruisers conserve fuel during transits by taking advantage of multiple engine configurations
- The tool was successfully demonstrated but did not gain much traction at the time because of a lack of incentive for ships to use their fuel efficiently



Transit Fuel Planner

Ship:		Ship 1: LSD41						Ship 2	
Fuel Burned:		99,982 gallons						157,021	
Fuel Saved:		13,894 gallons						22,437	
Extra Time on Station:		36.9 hours (377 gph)						30.4 hours	
Date/Time	PIM Center (nm)	Spd (kts)	Mode	Dist (nm)	PIM POS	Fuel %	Spd (kts)	Mode	Dist (nm)
12/10/2016 13:30	0	21	Full 2E	0	0	100.0%	21	Trail Shaft	0
12/10/2016 13:45	3.82	21	Full 2E	5.25	1.43	100.0%	21	Trail Shaft	5.25
12/10/2016 14:00	7.63	20	Full 2E	10.5	2.87	99.9%	20	Trail Shaft	10.5
12/11/2016	160.31	Drill 1; 5	Split 1E	210.5	50.19	98.1%	Drill 1; 5	Trail Shaft	210.5
12/11/2016 3:00	206.11	18	Full 2E	225.5	19.39	98.0%	17	Trail Shaft	225.5
12/11/2016 10:45	324.43	16	Split 1E	365	40.57	97.0%	17	Trail Shaft	365
12/11/2016 17:45	431.3	16	Split 1E	477	45.7	96.3%	17	Trail Shaft	477
12/11/2016 18:00	435.11	16	Split 1E	481	45.89	96.2%	17	Trail Shaft	481
12/11/2016 18:15	438.93	16	Split 1E	485	46.07	96.2%	16	Trail Shaft	485
12/12/2016	526.72	Drill 2; 5	Split 1E	577	50.28	95.6%	Drill 2; 5	Trail Shaft	577
12/12/2016 3:00	572.52	18	Full 2E	592	19.48	95.5%	17	Trail Shaft	592
12/12/2016 10:45	690.84	16	Split 1E	731.5	40.66	94.5%	17	Trail Shaft	731.5
12/12/2016 18:30	809.16	16	Split 1E	855.5	46.34	93.7%	16	Trail Shaft	855.5
12/13/2016	893.13	Drill 3; 5	Split 1E	943.5	50.37	93.1%	Drill 3; 5	Trail Shaft	943.5
12/13/2016 3:00	938.93	18	Full 2E	958.5	19.57	93.0%	17	Trail Shaft	958.5

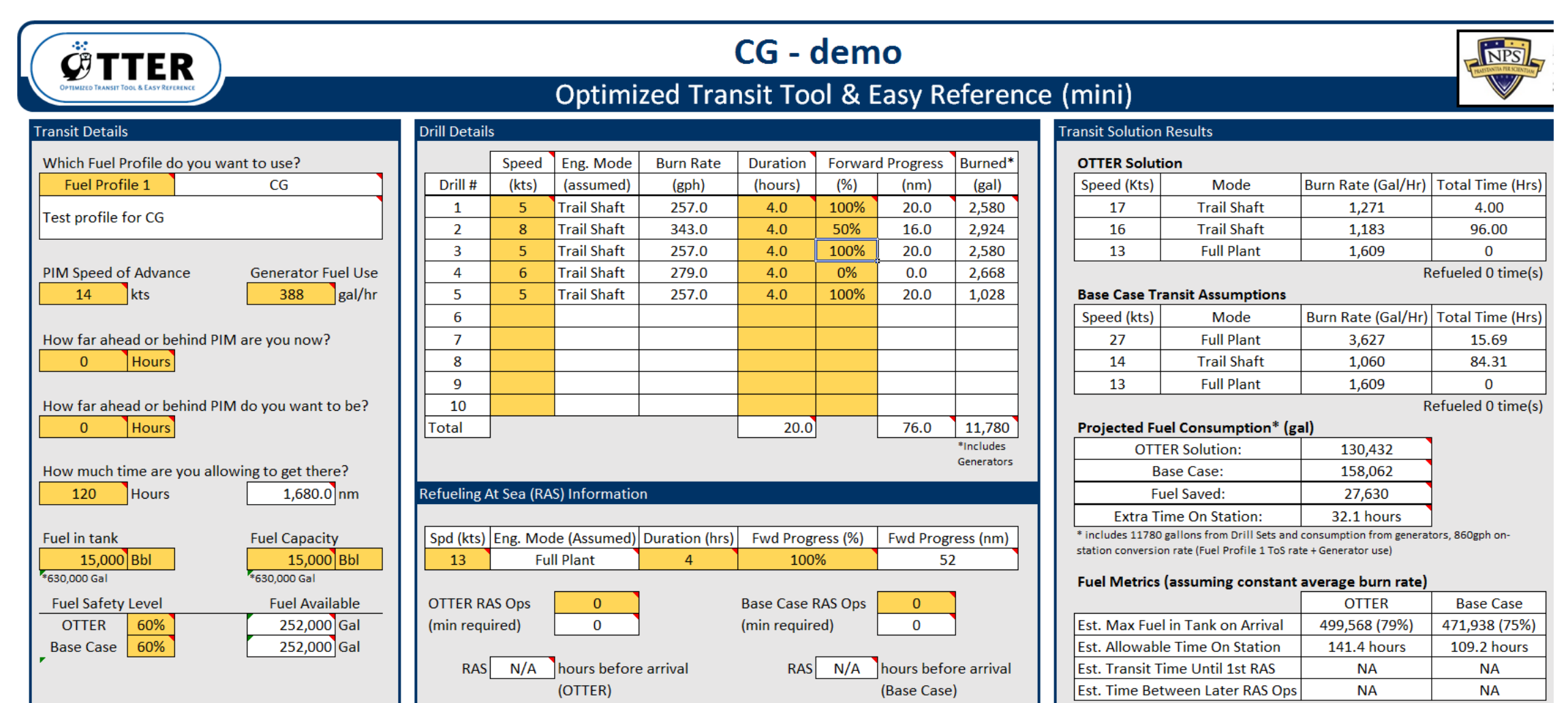
Example transit solution from OTTER

Creation of OTTER

- Optimized Transit Tool & Easy Reference (OTTER) started as a collaboration between the Energy Academic Group and NPS thesis student LCDR Korban Blackburn
- OTTER improved upon the original TFP, adding more transit planning features and controls and by expanding the Mixed-Mode Fuel Savings method to every ship class
- Typical fuel savings ranged from 5% to 15%

Transition to OTTER mini

- OTTER mini is a macro-free tool that recreates the key features of OTTER without the use of Excel macros
- OTTER mini was developed to facilitate testing on shipboard systems where macro restrictions had hindered previous testing efforts
- The full version of OTTER may be further pursued later after the OTTER concept gains more traction with OTTER mini



OTTER mini transit planning interface

OTTER in the Field

- OTTER mini is currently deployed on the USS Wasp for user acceptance trials and program validation at sea. The program is available for any ships or commands who interested in conducting further testing.
- The next steps in integrating OTTER in the fleet are to further validate the program through more trials at sea, and to develop training material to teach sailors how to use OTTER.

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