

Advanced Ship Data Bank
DTNSRDC, Bldg. 19, A223
Bethesda, Maryland 20084

10-U0 8331



FWD FOIL CAVITATION
INCEPTION PREDICTION

0 MARCH 1976



INCIPIENT CAVITATION PREDICTION TECHNIQUES

INCORPORATES	10 MAR 1976 BOEING	DTNSRDC
SPAN LOADING ANALYSIS	YES	NO
POTENTIAL FLOW SOLUTION	VORTEX DISTRIBUTION (3-D)	APPROXIMATE CONFORMAL MAPPING (2-D)
ANGLE OF ATTACK	YES	YES
FLAP DEFLECTION	YES	YES
FREE SURFACE EFFECTS	YES	NO
LEADING EDGE PREDICTION	YES	YES
MID-CHORD PREDICTION	YES	NO
C_{PCRIT} FOR CAVITATION	C_{PMIN} OVER 1% OF CHORD	C_{PMIN}

CORRELATION OF 3D WITH 2D PRESSURE DISTRIBUTION

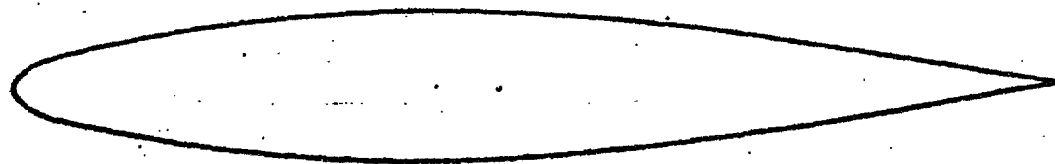
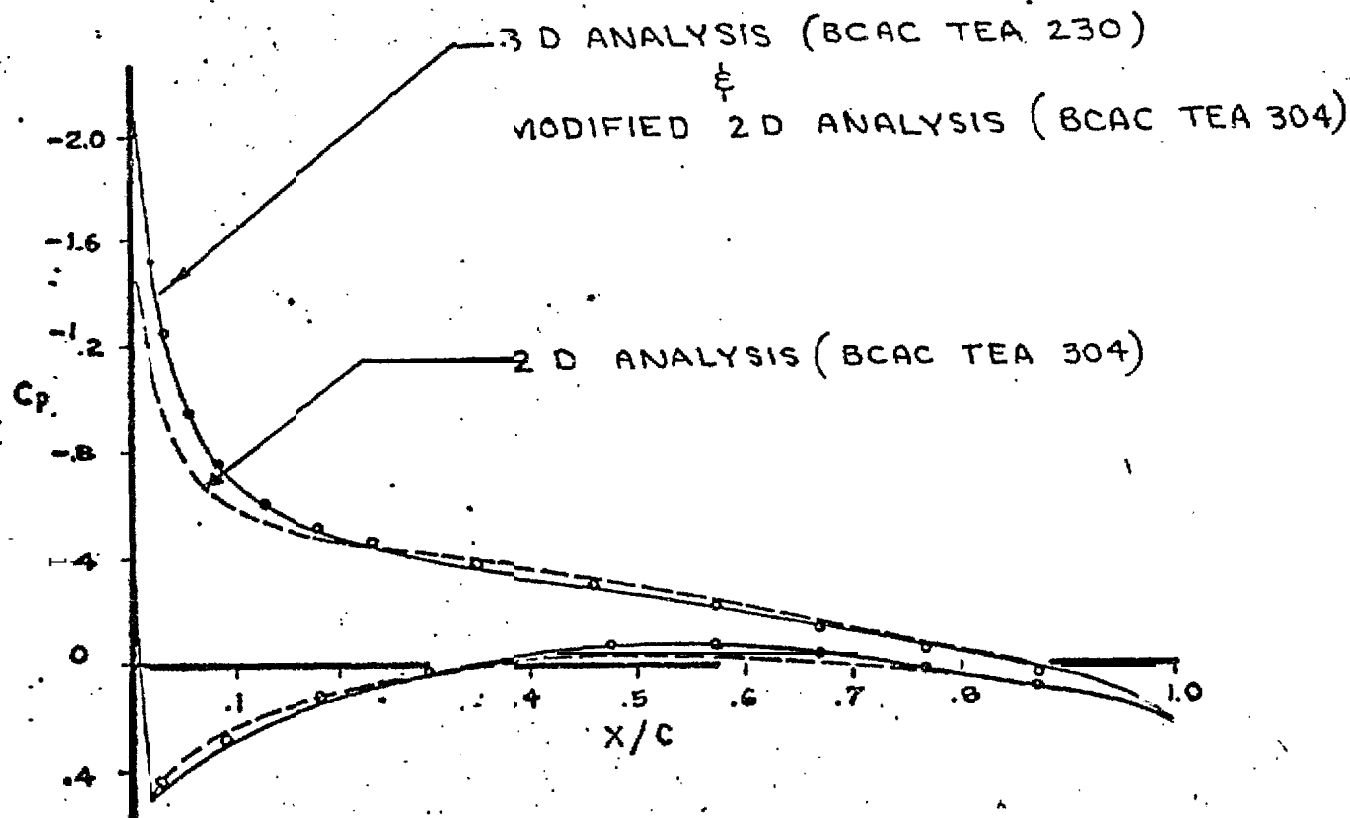
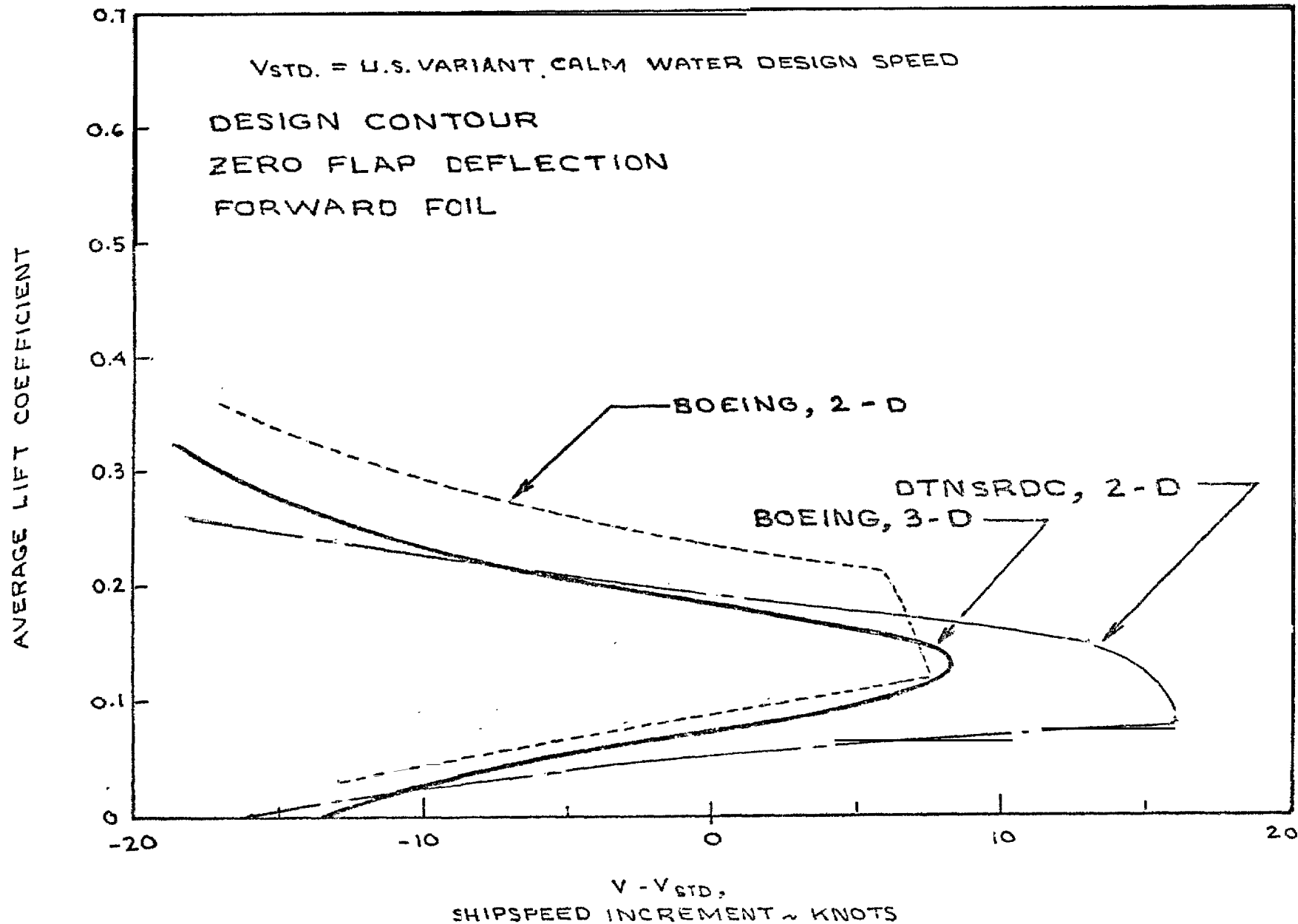




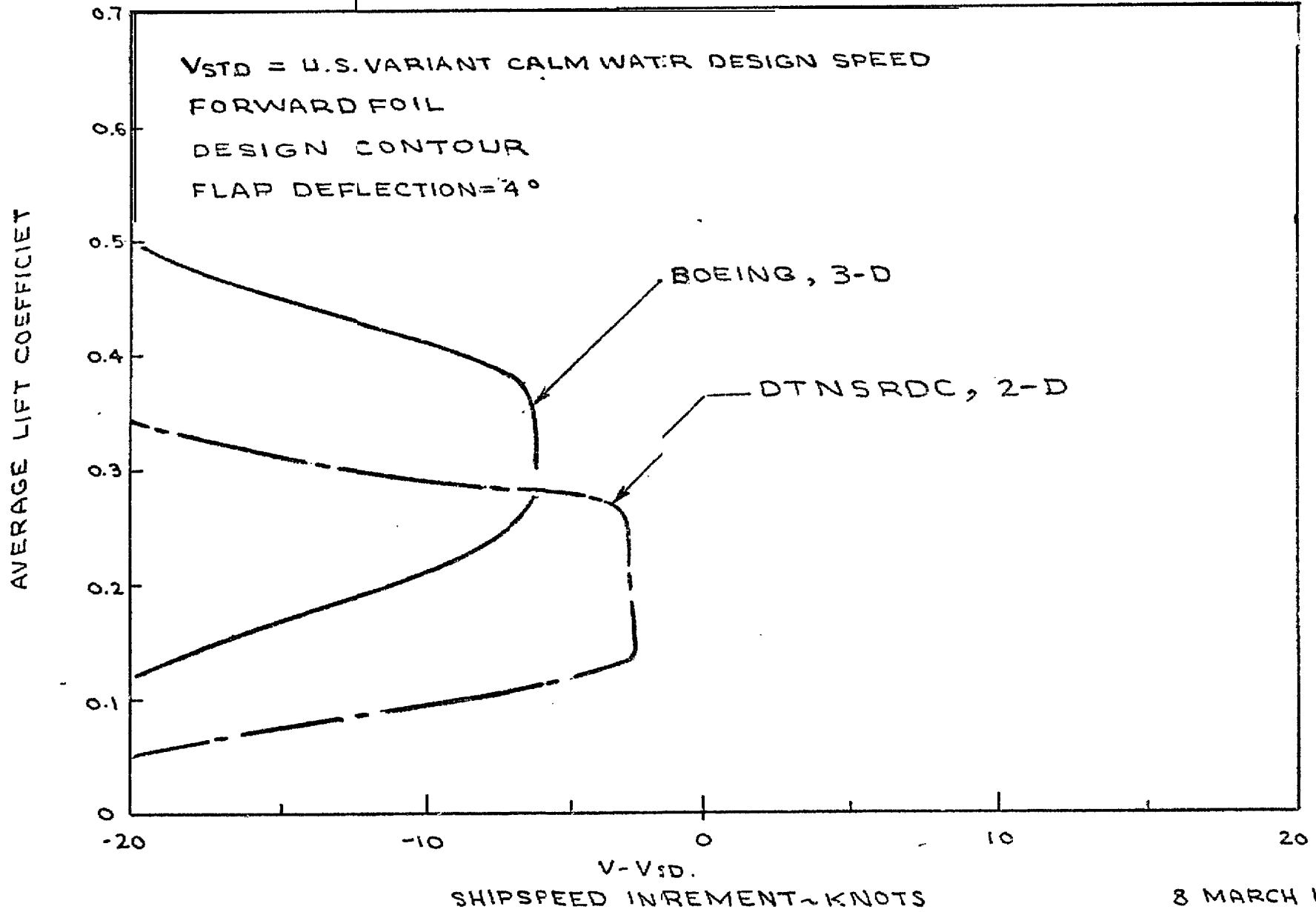
FIGURE
CALCULATION COMPARISON



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FIGURE
CALCULATION (COMPARISON)

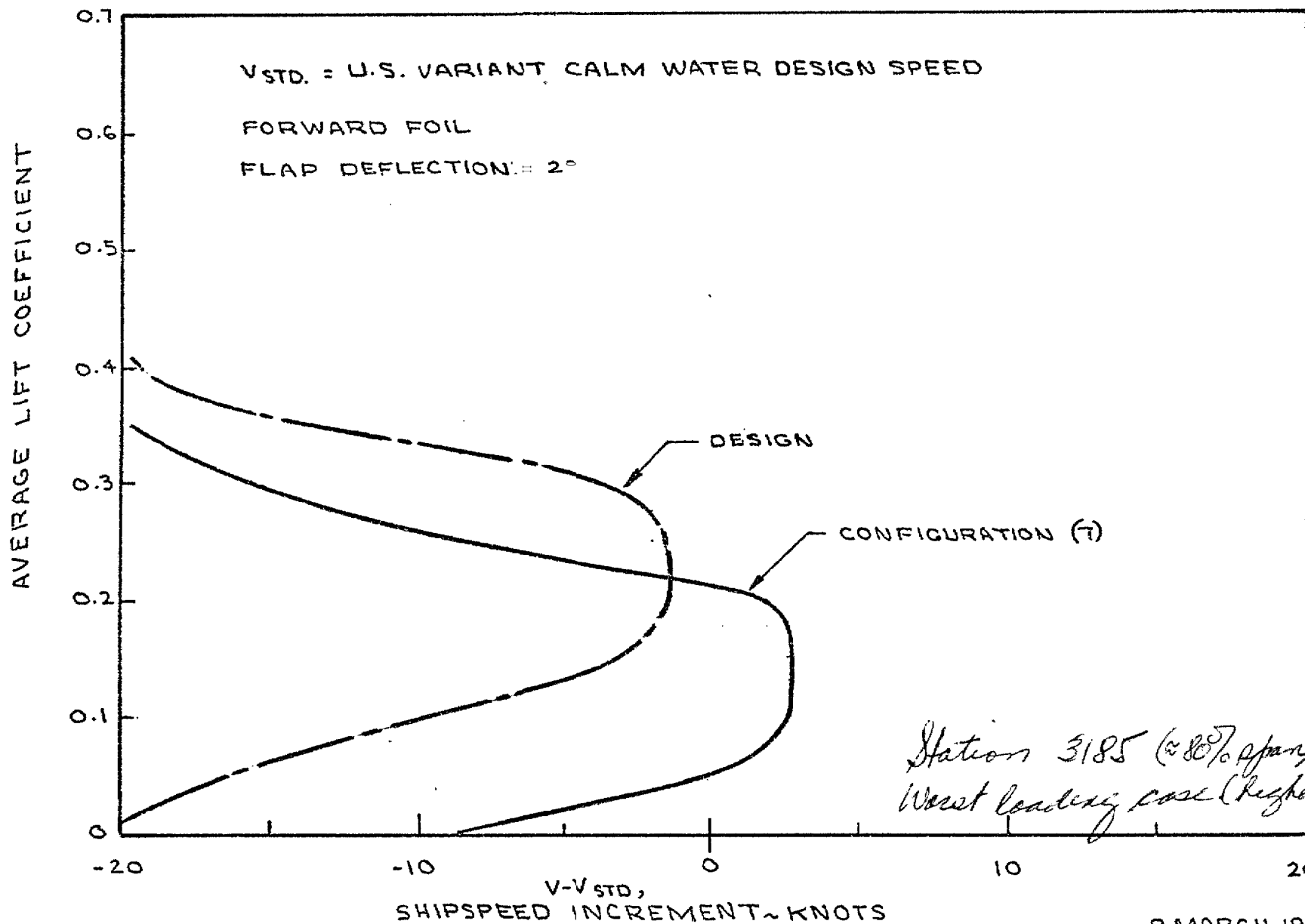


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FIGURE

DESIGN / AS-BUILT COMPARISON



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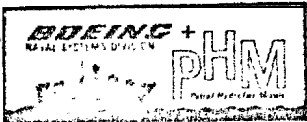


FIGURE
CALCULATED CAVITATION LIMITS

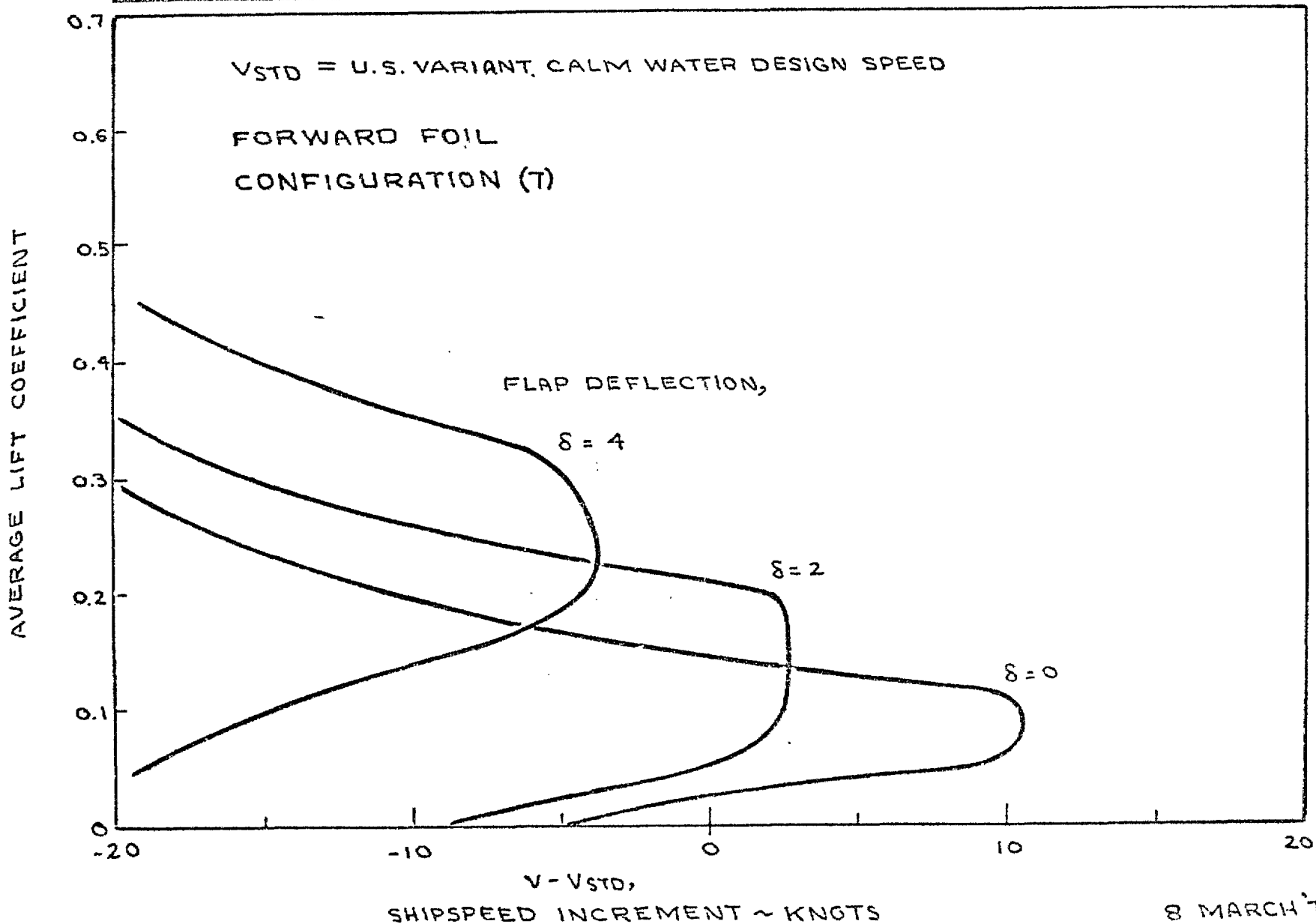
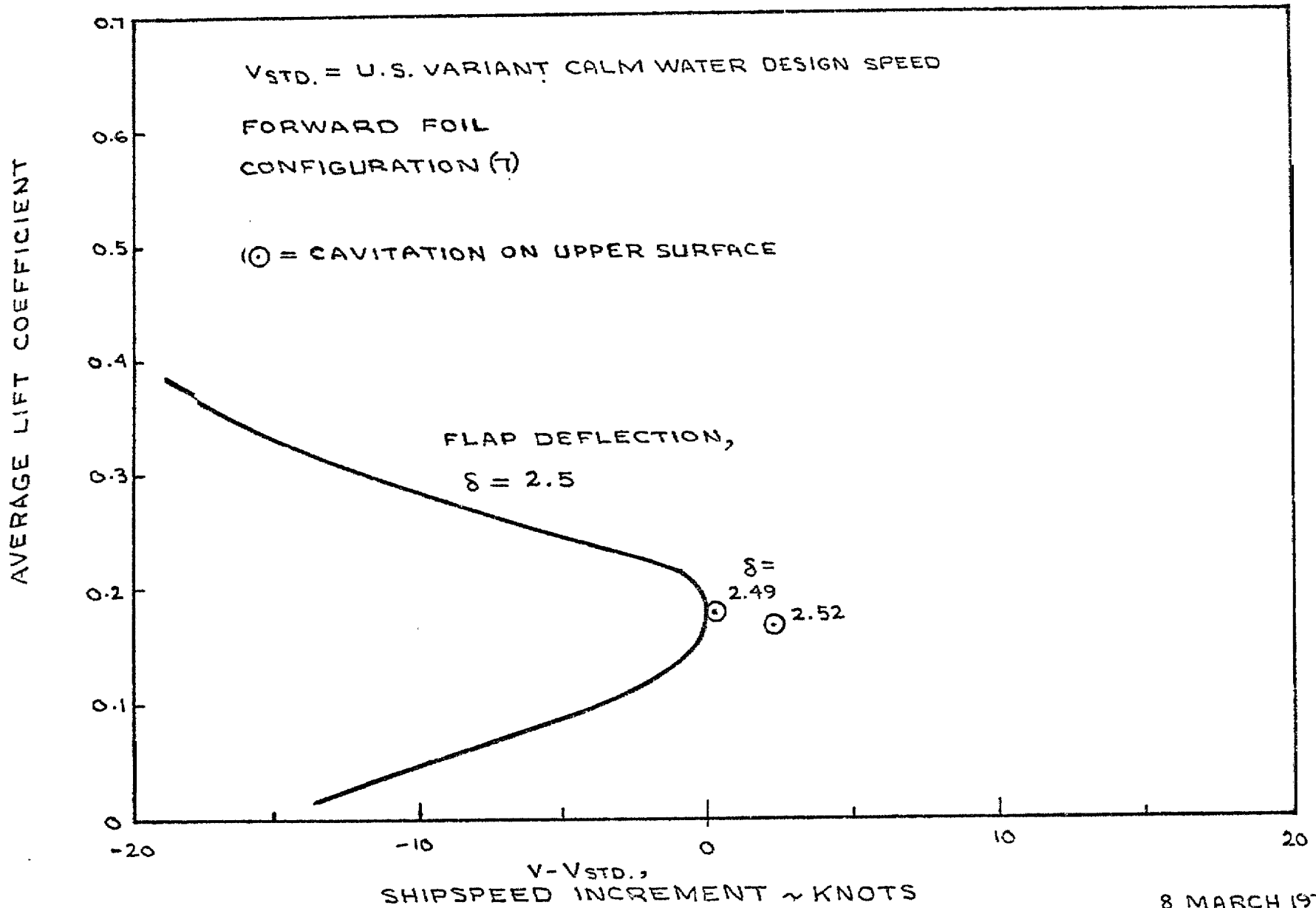




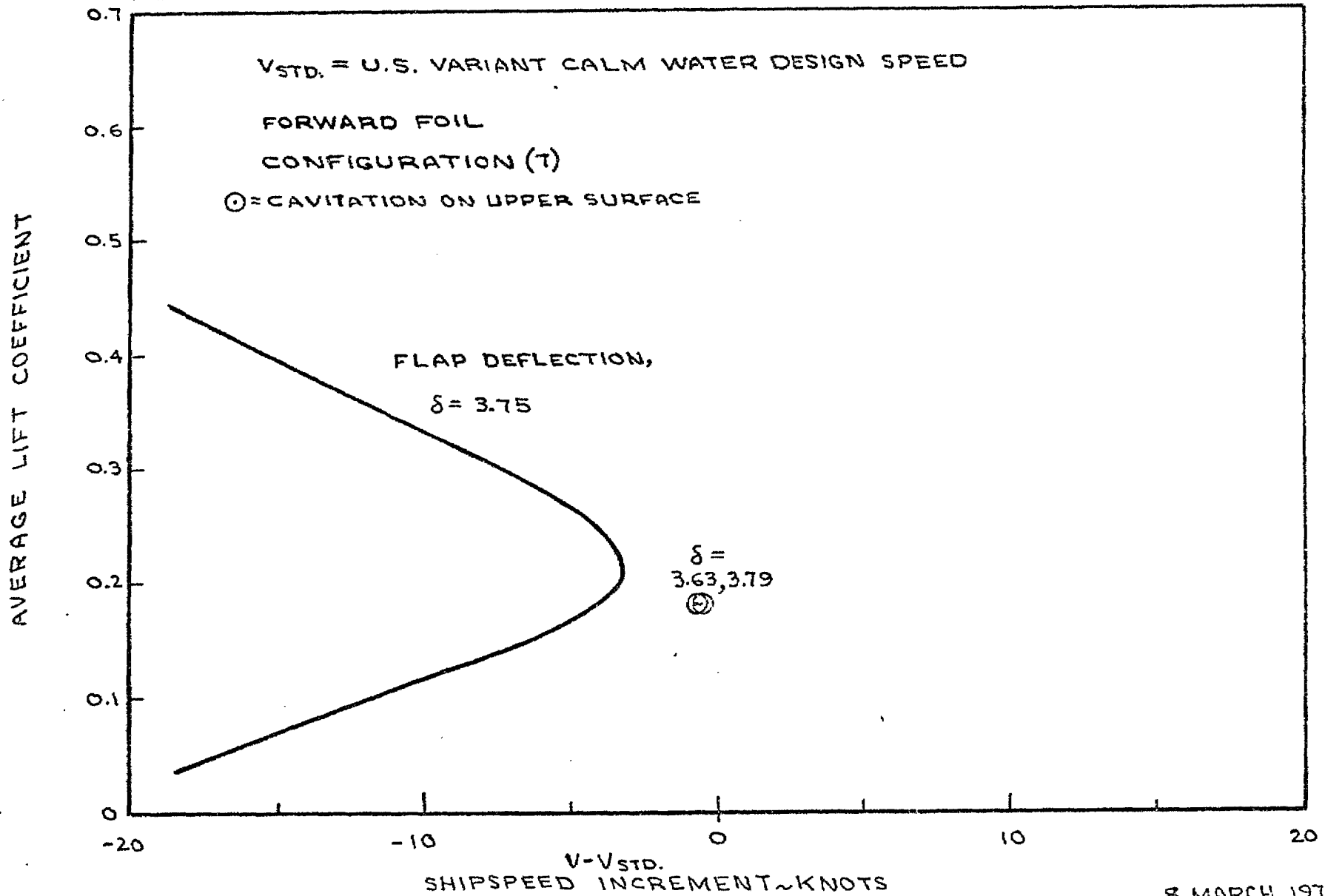
FIGURE
OBSERVATION / CALCULATION COMPARISON



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FIGURE
OBSERVATION/CALCULATION COMPARISON



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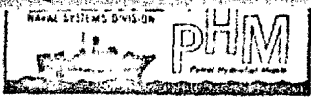
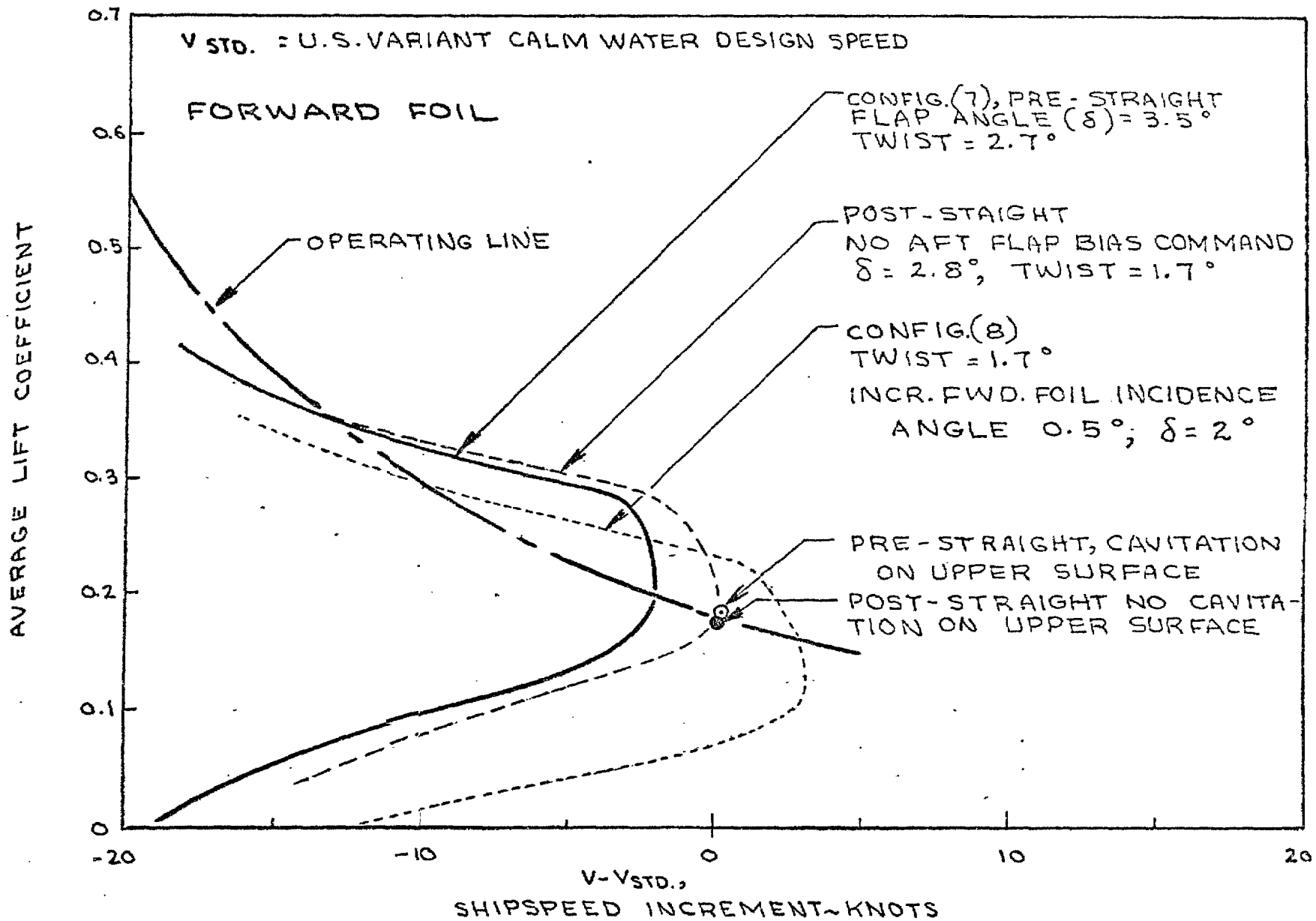


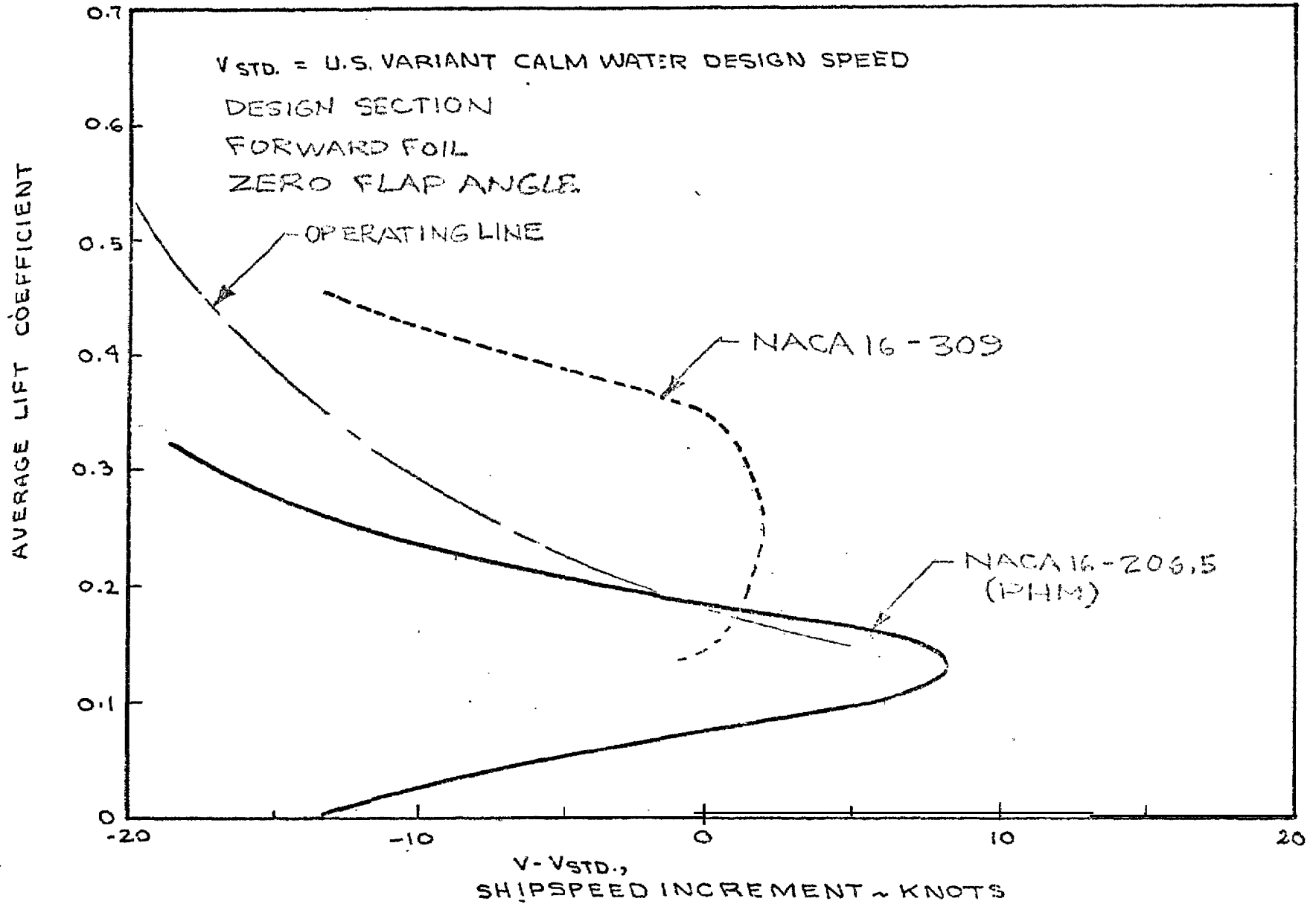
FIGURE EFFECT OF FLAME STRAIGHTENING



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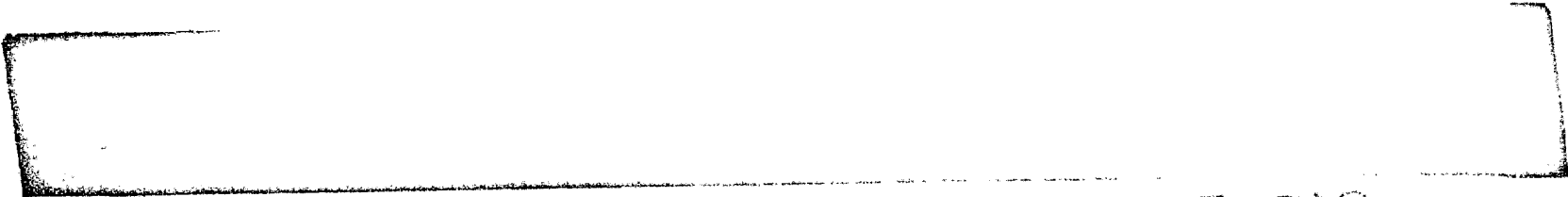
EFFECT OF SHAPE CHANGE





FWD FOIL CONCLUSIONS & STATUS

- 3-D MODEL MOST REALISTIC FOR CAVITATION PREDICTION
- CAVITATION OBSERVATION CONSISTENT WITH PREDICTIONS
- SHOULD INCREASE FWD FOIL INCIDENCE ANGLE 0.5°

- 
- SHOULD CONSIDER CAMBER INCREASE FOR PRODUCTION, REQUIRES MORE ANALYSIS

3/10/76