

**Table 1.** Hurricane Isabel Maximum Potential Intensity (TEE-MPI). Distant surface air properties:  $P_1 = 101.1$  kPa,  $T_1 = 27.8$  °C,  $U_1 = 80$ ,  $r_1 = r_2 = 19.06$  g kg<sup>-1</sup>,  $h_1 = 76572$  J kg<sup>-1</sup>,  $s_1 = s_2 = 266.8$  J K<sup>-1</sup>kg<sup>-1</sup>. Eyewall humidity approach  $B = 3\%$ ,  $U_3 = 100 - B = 97\%$ .

Temperature approach  $A = 2$  °C

Eyewall SST (°C)	<b>26.0</b>	<b>26.5</b>	<b>27.0</b>	<b>27.5</b>
------------------	-------------	-------------	-------------	-------------

Temperature approach  $A = 1$  °C

Eyewall SST (°C)	<b>25.0</b>	<b>25.5</b>	<b>26.0</b>	<b>26.5</b>
------------------	-------------	-------------	-------------	-------------

Rising air properties:

$P_2 = P_3$ (kPa)	<b>99.14</b>	<b>97.72</b>	<b>96.01</b>	<b>94.36</b>
$T_2$ (°C)	26.12	24.90	23.41	22.72
$U_2$ (%)	86.8	92.2	99.3	101.75
$h_2$ (J kg <sup>-1</sup> )	74830	73557	72005	70490

$T_3$ (°C)	<b>24</b>	<b>24.5</b>	<b>25.0</b>	<b>25.5</b>
$U_3$ (%)	<b>97</b>	<b>97</b>	<b>97</b>	<b>97</b>
$r_3 = r_4$ (g kg <sup>-1</sup> )	18.69	19.57	20.55	21.57
$h_3 = h_4 + (1+r_4)$ gz	71686	74434	77459	80590
$s_3 = s_4$ (J K <sup>-1</sup> kg <sup>-1</sup> )	256.2	269.7	285.2	300.8

$P_4$ (kPa)	15.0	10.0	10.0	10.0
$T_4$ (°C)	-61.45	-80.92	-77.72	-74.42
$T_{4V}$ (°C)	-65.32	-84.69	-81.65	-78.61
$T_{4A}$ (°C)	-62.9	-80.1	-80.1	-80.1
$z_4$ (m)	14220	16570	16570	16570
$h_4$ (J kg <sup>-1</sup> )	-70275	-91130	-88264	-85299

**Base Pressure Reduction (kPa)**

$\Delta P_{12}$	<b>1.96</b>	<b>3.38</b>	<b>5.09</b>	<b>6.74</b>
$\Delta P_2$	n/a	base	1.71	3.36

**Work (J kg<sup>-1</sup>)**

$W = h_1 - h_2$	<b>1742</b>	<b>3015</b>	<b>4567</b>	<b>6081</b>
$\Delta W$	n/a	base	1552	3066

**Velocity (m s<sup>-1</sup>)**

$v = (2W)^{0.5}$	<b>59.0</b>	<b>77.6</b>	<b>95.6</b>	<b>110.3</b>
$\Delta v$ (%)	n/a	base	18.0	32.7

**Sensitivity**

$\Delta P_3 / \Delta T_3 = 3.36$  kPa/K  
 $\Delta W / \Delta T_3 = 3076$  J kg<sup>-1</sup>/K  
 $\Delta v / \Delta T_3 = 32.7$  m s<sup>-1</sup>/K, versus 2 m s<sup>-1</sup>/K for E-MPI method.

**Heat Supplied (J kg<sup>-1</sup>)**

$Q_{23r}$	-3144	877	5454	10100
$Q_{12i}$	-4886	-2138	887	4018
$\Delta Q_{23r}$	n/a	base	4577	9223

**Incremental Efficiency**

$n$ (%) = $\Delta W_{12} / \Delta Q_{23r}$	n/a	base	33.9	33.2
$n$ (%) = $1 - T_4 / T_3$	28.8	35.4	33.5	33.5