Run title	-->	i-mode 2019 pmu
PROCESS Version	-->	1.0.16
Date:	-->	16/08/2019
Time:	-->	14:58
User:	-->	apearce
Optimising:	-->	Plasma major radius

Plasma composition:
Number densities relative to electron density:

D + T	= 0.8996
He	= 0.05
Xe	= 8.828e-06

Colour Legend:
ITR
OP

Geometry:

R_0	= 9.955 m
a	= 3.211 m
A	= 3.1
κ_{95}	= 1.65
δ_{95}	= 0.3333
Surface area	= 1760 m^2
Plasma volume	= 3407 m^3
No. of TF coils	= 16
inboard blanket+shield	= 1.055 m
ouboard blanket+shield	= 1.782 m
Fusion power	= 1274 MW

Physics:

I_p	= 21.37 MA
Vacuum B_T at R_0	= 4.918 T
q_{95}	= 3
β_N, thermal	= 1.439 % m T MA^{-1}
β_N, total	= 1.652 % m T MA^{-1}
β_P, thermal	= 0.5679
β_P, total	= 0.6521
$< t_e >$	= 10.35 keV
$< n_e >$	= 5.412e+19 m^{-3}
$< n_{e,\,line} > / n_G$	= 0.9
$T_{e0} / < T_e >$	= 2.297
$n_{e0} / < n_{e,\,vol} >$	= 1.287
Z_{eff}	= 1.119
$n_Z / < n_{e,\,vol} >$	= 8.828e-06
τ_e	= 3.69 s
H-factor	= 0.8
Scaling law	= IPB98(y,2)

Coil currents etc:

PF 1	= 24.03 MA
PF 3	= -8.484 MA
PF 5	= -6.022 MA
Startup flux swing	= 448.3 Wb
Available flux swing	= -1084 Wb
Burn time	= 4.353 hrs

TF coil type is WST Nb3Sn

Peak field at conductor (w. rip.)	= 10.44 T
I/I_{crit}	= 0.6724
TF Temperature margin	=ERROR! Var missing
CS Temperature margin	= 1.712 K
Conduit Von Mises stress	= 5.607e+08 Pa
Case Von Mises stress	= 6.451e+08 Pa
Allowable stress	= 6.6e+08 Pa
Mass per TF coil	= 1.222e+06 kg

Power flows:

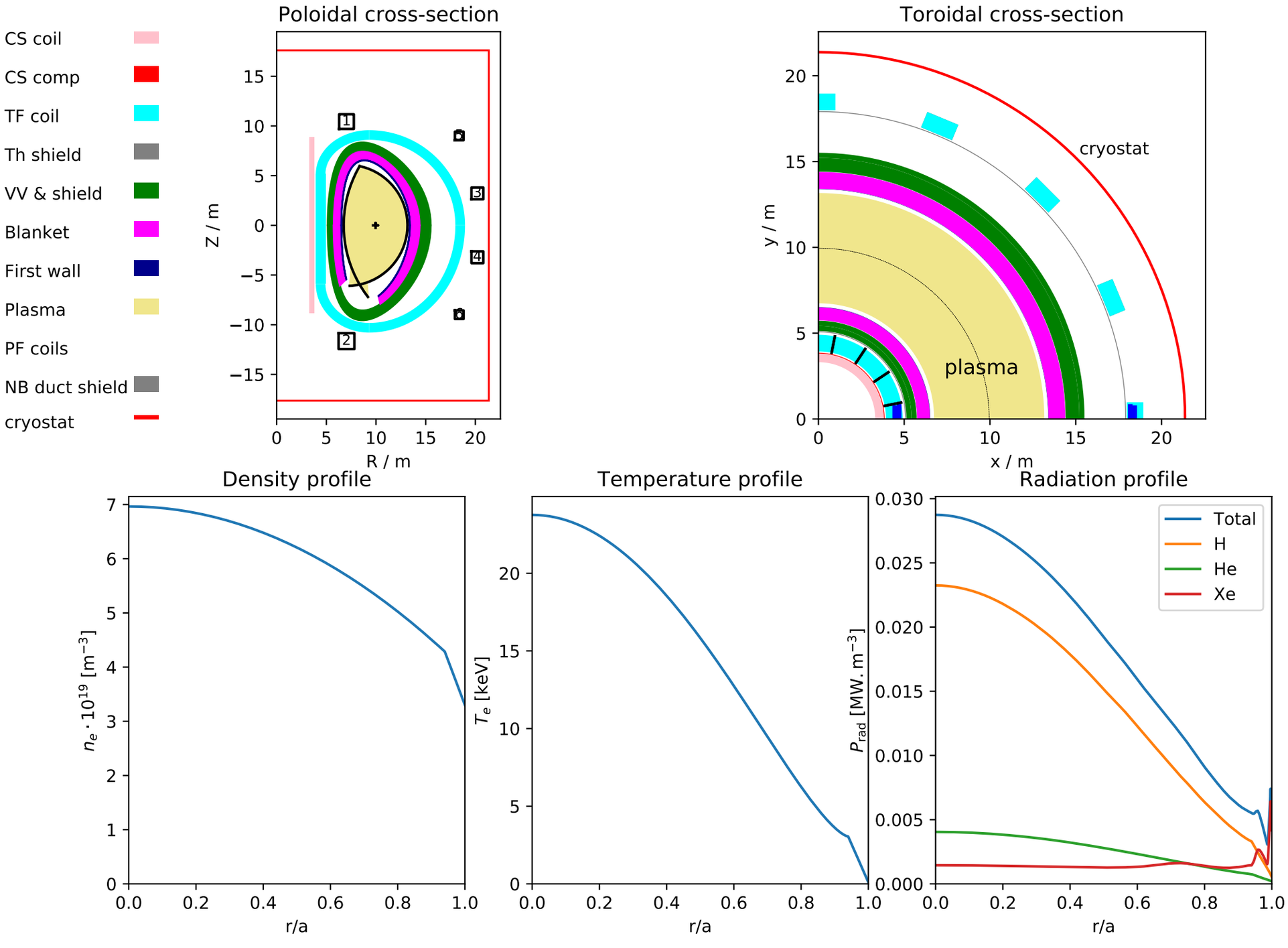
Nominal neutron wall load	= 0.5325 MW m^{-2}
Normalised radius of 'core' region	= 0.75
Electron density at pedestal	= 4.287e+19 m^{-3}
r/a at density pedestal	= 0.94
Helium fraction	= 0.05
Core radiation	= 24.97 MW
Total radiation	= 37.57 MW
Nuclear heating in blanket	= 965.6 MW
Nuclear heating in shield	= 1.303 MW
Power to divertor	= 256 MW
H-mode threshold	= 256 MW
Divertor life	= 1.573 years
Primary (high grade) heat	= 1686 MW
Gross cycle efficiency	= 37.5 %
Net cycle efficiency	= 32 %
Gross electric power	= 632.3 MW
Net electric power	= 235.7 MW
Fusion-to-electric efficiency $\frac{P_{e,\,net}}{P_{fus}}$	= 18.5 %

Electron Cyclotron Current Drive:

Steady state auxiliary power	= 50 MW
Power for heating only	= 50 MW
Bootstrap fraction	= 0.001
Auxiliary fraction	= 0
Inductive fraction	= 0.999
Plasma heating used for H factor	= 268.6 MW
$\frac{P_{div}}{R_0}$	= 25.72 MW m^{-1}
$\frac{P_{div}}{< n > R_0}$	= 47.52 $\times 10^{-20}$ MW m^2
$\frac{P_{div}}{P_{LH}}$	= 1
H* (non-rad. corr.)	= 0.7672

Costs

Cost of electricity	=ERROR! Var missing


CS coil
CS comp
TF coil
Th shield
VV & shield
Blanket
First wall
Plasma
PF coils
NB duct shield
cryostat
Poloidal cross-section
Z / m
R / m
1
2
3
4
Toroidal cross-section
cryostat
plasma
y / m
x / m
Density profile
$n_e \cdot 10^{19}$ [m^{-3}]
r/a
Temperature profile
T_e [keV]
r/a
Radiation profile
P_{rad} [MW. m^{-3}]
Total
H
He
Xe
r/a