Run title	-->	example qh-mode plasma scenario
PROCESS Version	-->	1.0.16
Date:	-->	16/08/2019
Time:	-->	15:15
User:	-->	apearce
Optimising:	-->	Plasma major radius

Plasma composition:

Number densities relative to electron density:

D + T	= 0.8377
He	= 0.06839
Xe	= 0.0004622
W	= 5e-05

Colour Legend:

ITR

OP

Geometry:

R_0	= 9.299 m
a	= 3 m
A	= 3.1
κ_{95}	= 1.65
δ_{95}	= 0.3333
Surface area	= 1535 m^2
Plasma volume	= 2776 m^3
No. of TF coils	= 16
inboard blanket+shield	= 1.055 m
ouboard blanket+shield	= 1.782 m
Fusion power	= 2167 MW

Physics:

I_p	= 18.49 MA
Vacuum B_T at R_0	= 5.316 T
q_{95}	= 3.5
β_N, thermal	= 2.337 % m T MA^{-1}
β_N, total	= 2.816 % m T MA^{-1}
β_P, thermal	= 1.066
β_P, total	= 1.285
$< t_e >$	= 12.87 keV
$< n_e >$	= 7.172e+19 m^{-3}
$< n_{e,\,line} > / n_G$	= 1.2
$T_{e0} / < T_e >$	= 2.275
$n_{e0} / < n_{e,\,vol} >$	= 1.275
Z_{eff}	= 2.387
$n_Z / < n_{e,\,vol} >$	= 0.0005122
τ_e	= 3.546 s
H-factor	= 1.1
Scaling law	= IPB98(y,2)

Coil currents etc:

PF 1	= 16.27 MA
PF 3	= -8.484 MA
PF 5	= -5.588 MA
Startup flux swing	= 375 Wb
Available flux swing	= -649.2 Wb
Burn time	= 2 hrs

TF coil type is WST Nb3Sn

Peak field at conductor (w. rip.)	= 12.01 T
I/I_{crit}	= 0.6444
TF Temperature margin	=ERROR! Var missing
CS Temperature margin	= 3.744 K
Conduit Von Mises stress	= 4.467e+08 Pa
Case Von Mises stress	= 5.8e+08 Pa
Allowable stress	= 5.8e+08 Pa
Mass per TF coil	= 1.528e+06 kg

Power flows:

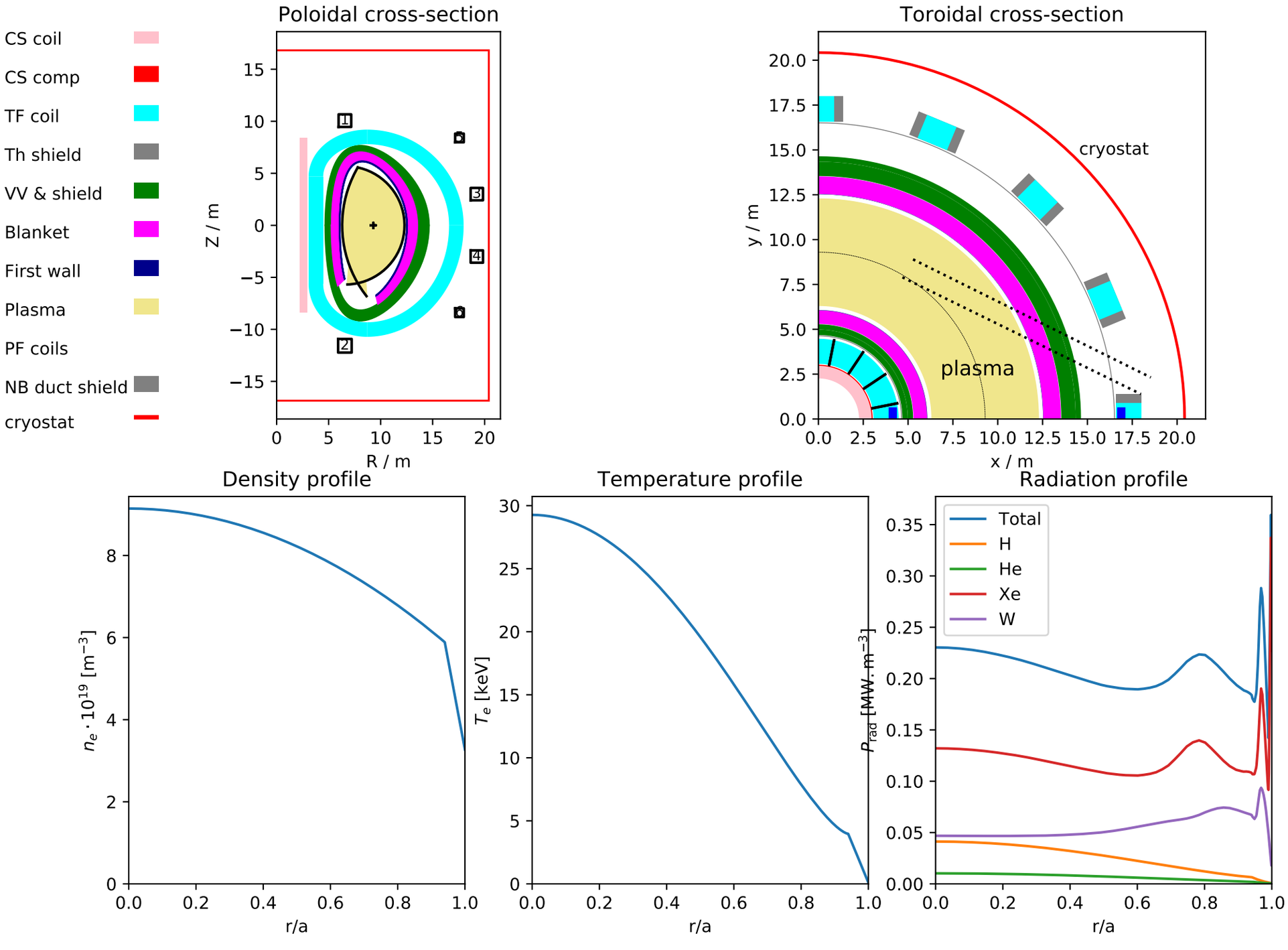
Nominal neutron wall load	= 1.038 MW m^{-2}
Normalised radius of 'core' region	= 0.75
Electron density at pedestal	= 5.887e+19 m^{-3}
r/a at density pedestal	= 0.94
Helium fraction	= 0.06839
Core radiation	= 122.5 MW
Total radiation	= 315.1 MW
Nuclear heating in blanket	= 1674 MW
Nuclear heating in shield	= 1.634 MW
Power to divertor	= 174.6 MW
H-mode threshold	= 116.4 MW
Divertor life	= 4.26 years
Primary (high grade) heat	= 2879 MW
Gross cycle efficiency	= 37.5 %
Net cycle efficiency	= 31.41 %
Gross electric power	= 1080 MW
Net electric power	= 500 MW
Fusion-to-electric efficiency $\frac{P_{e,\,net}}{P_{fus}}$	= 23.07 %

Neutral Beam Current Drive:

Steady state auxiliary power	= 76 MW
Power for heating only	= 76 MW
Bootstrap fraction	= 0.3846
Auxiliary fraction	= 5.521e-05
Inductive fraction	= 0.6153
NB gamma	= 0.285 10^{20} A W^{-1} m^{-2}
NB energy	= 1000 keV
Plasma heating used for H factor	= 367.1 MW
$\frac{P_{div}}{R_0}$	= 18.78 MW m^{-1}
$\frac{P_{div}}{< n > R_0}$	= 26.18 $\times 10^{-20}$ MW m^2
$\frac{P_{div}}{P_{LH}}$	= 1.501
H* (non-rad. corr.)	= 0.9893

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
W
r/a