CLAIMS:

What is claimed is:

1. A hydrocarbon pyrolysis process, comprising:

introducing a flow of a hydrocarbon feed into a pyrolysis furnace comprising a first radiant coil and a second radiant coil to establish flows of the hydrocarbon feed into the first and second radiant coils;

pyrolysing at least a portion of the hydrocarbon feed in the first radiant coil and in the second radiant coil to produce a pyrolysis effluent and to deposit coke on an inner surface of each of the first radiant coil and the second radiant coil;

decreasing the flow of the hydrocarbon feed into the first radiant coil and maintaining the flow of the hydrocarbon feed into the second radiant coil, wherein the flow of the hydrocarbon feed into the pyrolysis furnace is decreased by about 10 vol. % to about 90 vol. %; and

introducing steam at a pressure of ≥ 690 kPag into the first radiant coil of the pyrolysis furnace to remove at least a portion of the coke deposited on the inner surface of the first radiant coil.

2. The process of claim 1, wherein the steam is supplied from a dilution steam line maintained at a pressure of ≥ 930 kPag.

3. The process of claim 1 or 2, wherein the steam comprises steam at a pressure of ≥ 930 kPag or ≥ 1200 kPag.

4. The process of any one of claims 1 to 3, wherein the steam comprises steam at a pressure of ≥ 1380 kPag.

5. The process of any one of claims 1 to 4, wherein the steam comprises steam supplied from a dilution steam line maintained at a pressure of ≥ 1380 kPag.

6. The process of any one of claims 1 to 5, further comprising comparing a maximum crossover temperature of the pyrolysis furnace and a target temperature of the pyrolysis furnace to determine a maximum firing rate of the pyrolysis furnace to maintain a crossover temperature of the pyrolysis furnace at or below the target temperature of the pyrolysis furnace.

7. The process of claim 6, further comprising utilizing an automated system to maintain the crossover temperature of the pyrolysis furnace at or below the target temperature of the pyrolysis furnace.

8. The process of any one of claims 1 to 7, wherein the steam introduced into the first radiant coil comprises ≤ 1 wt. % of water.

9. The process of any one of claims 1 to 8, further comprising increasing the flow of the hydrocarbon feed into the first radiant coil after the portion of the coke deposited on the inner surface of the first radiant coil has been removed.

10. The process of any one of claims 1 to 9, wherein the step of decreasing the flow of the hydrocarbon feed into the first radiant coil comprises terminating the flow of the hydrocarbon feed into the first radiant coil.

11. The process of any one of claims 1 to 10, wherein the transition from pyrolysis to decoking is ≤ 60 minutes. ≤ 45 minutes, ≤ 30 minutes, or ≤ 15 minutes.

12. The process of any one of claims 1 to 11, wherein the transition from pyrolysis to decoking is ≤ 45 minutes.

13. The process of any one of claims 1 to 10, wherein the transition from pyrolysis to decoking is ≤ 30 minutes.

14. The process of any one of claims 1 to 10, wherein the transition from pyrolysis to decoking is ≤ 15 minutes.

15. A hydrocarbon pyrolysis process, comprising:

introducing a flow of a hydrocarbon feed into a pyrolysis furnace comprising a first radiant coil and a second radiant coil to establish flows of the hydrocarbon feed into the first and second radiant coils;

pyrolysing at least a portion of the hydrocarbon feed in the first radiant coil and the second radiant coil to produce a pyrolysis effluent and to deposit coke on an inner surface of each of the first radiant coil and the second radiant coil;

decreasing the flow of the hydrocarbon feed into the first radiant coil and maintaining the flow of the hydrocarbon feed into the second radiant coil wherein the flow of the hydrocarbon feed into the pyrolysis furnace is decreased 10 vol. % to 90 vol. %.;

introducing steam at a pressure of ≥ 930 kPag into the first radiant coil of the pyrolysis furnace to remove at least a portion of the coke deposited on the inner surface of the first radiant coil; and

adjusting a firing rate of the pyrolysis furnace to maintain a crossover temperature of the pyrolysis furnace at or below a target temperature of the pyrolysis furnace.

16. The process of claim 15, wherein an automated system is utilized to adjust the firing rate of the pyrolysis furnace.

17. The process of claim 16, wherein the automated system comprises a dynamic matrix control.

18. The process of any one of claims 15 to 17, wherein (i) the firing rate of the pyrolysis furnace and (ii) the amount of the steam introduced into the first radiant coil are both adjusted to optimize a composition of the pyrolysis effluent.

19. The process of any one of claims 15 to 18, wherein the steam is supplied from a dilution steam line maintained at a pressure of ≥ 930 kPag.

20. The process of any one of claims 15 to 19, wherein the steam comprises steam at a pressure of ≥ 1200 kPag.

21. The process of any one of claims 15 to 20, wherein the steam comprises steam at a pressure of ≥ 1380 kPag.

22. The process of any one of claims 15 to 21, wherein the steam is supplied from a dilution steam line maintained at a pressure of ≥ 1380 kPag.

23. The process of any one of claims 15 to 22, wherein the steam introduced into the first radiant coil comprises ≤ 1 wt. % of water.

24. The process of any one of claims 15 to 23, further comprising increasing the flow of the hydrocarbon feed into the first radiant coil after the portion of the coke deposited on the inner surface of the first radiant coil has been removed.

25. The process of any one of claims 15 to 24, wherein the step of decreasing the flow of the hydrocarbon feed into the first radiant coil comprises terminating the flow of the hydrocarbon feed into the first radiant coil.

26. The process of any one of claims 15 to 25, wherein the transition from pyrolysis to decoking is ≤ 15 minutes.

27. A hydrocarbon pyrolysis process, comprising:

introducing a flow of a hydrocarbon feed into at least one radiant coil of a pyrolysis furnace;

pyrolysing at least a portion of the hydrocarbon feed in the at least one radiant coil to produce a pyrolysis effluent and to deposit coke on an inner surface of the at least one radiant coil;

decreasing the flow of the hydrocarbon feed into the at least one radiant coil; and

introducing a flow of steam at a pressure of ≥ 690 kPag into the at least one radiant coil of the pyrolysis furnace to remove at least a portion of the coke deposited on the inner surface of the at least one radiant coil.

28. The process of claim 27 wherein the steam comprises steam at a pressure of ≥ 930 kPag.