CLAIMS:

What is claimed is:

1. A process for steam cracking hydrocarbons, comprising:

introducing a first hydrocarbon feed into one or more radiant coils disposed within a first segment of a firebox of a steam cracker to produce a first steam cracker effluent having a first coil outlet temperature, wherein the first segment comprises one or more burners providing heat thereto;

introducing a second hydrocarbon feed into one or more radiant coils disposed within a second segment of the firebox of the steam cracker to produce a second steam cracker effluent having a second coil outlet temperature, wherein the second segment comprises one or more burners providing heat thereto;

operating the one or more burners in the first and second segments at substantially the same firing rate such that an amount of heat produced by each of the one or more burners in the first and second segments is substantially the same;

controlling a feed rate of the first hydrocarbon feed introduced into the one or more radiant coils disposed within the first segment based, at least in part, on a composition of the first hydrocarbon feed and the first coil outlet temperature; and

controlling a feed rate of the second hydrocarbon feed introduced into the one or more radiant coils disposed within the second segment based, at least in part, on a composition of the second hydrocarbon feed and the second coil outlet temperature.

2. The process of claim 1, wherein the feed rate of the first hydrocarbon feed and the feed rate of the second hydrocarbon feed are different with respect to one another.

3. The process of claim 1 or claim 2, wherein the first hydrocarbon feed and the second hydrocarbon feed each include steam, and wherein an amount of steam in the first hydrocarbon feed is the same as an amount of steam in the second hydrocarbon feed.

4. The process of claim 1 or claim 2, wherein the first hydrocarbon feed and the second hydrocarbon feed each include steam, and wherein an amount of steam in the first hydrocarbon feed is different than an amount of steam in the second hydrocarbon feed.

5. The process of any of claims 1 to 4, wherein the first segment comprises a plurality of burners, wherein at least one burner in the plurality of burners is shut down while maintaining operation of the additional one or more burners in the plurality of burners at substantially the same firing rate as the one or more burners in the second segment.

6. The process of any of claims 1 to 5, wherein a composition of the first hydrocarbon feed and a composition of the second hydrocarbon feed are different.

7. The process of any of claims 1 to 6, wherein the first coil outlet temperature and the second coil outlet temperature are different.

8. The process of any of claims 1 to 7, wherein the first hydrocarbon feed and the second hydrocarbon feed independently comprise ethane, propane, one or more C_4 hydrocarbons, one or more C_5 hydrocarbons, steam cracked gas oil, steam cracked residues, gas oils, heating oil, jet fuel, diesel, kerosene, gasoline, coker naphtha, steam cracked naphtha, catalytically cracked naphtha, hydrocrackate, reformate, raffinate reformate, Fischer-Tropsch liquids, Fischer-Tropsch gases, natural gasoline, distillate, virgin naphtha, crude oil, atmospheric pipestill bottoms, vacuum pipestill streams including bottoms, wide boiling range naphtha to gas oil condensate, heavy non-virgin hydrocarbon streams from refineries, vacuum gas oils, heavy gas oil, naphtha contaminated with crude, atmospheric resid, heavy residium, C4's/residue admixture, naphtha residue admixture, or any mixture thereof.

9. The process of any of claims 1 to 7, wherein at least one of the first and second hydrocarbon feeds comprises greater than 50 wt% of ethane, based on a total weight of the hydrocarbon feed.

10. The process of any of claims 1 to 7, wherein the first hydrocarbon feed comprises primarily ethane and the second hydrocarbon feed comprises primarily propane.

11. The process of any of claims 1 to 5, wherein the first hydrocarbon feed comprises a first refinery gas stream comprising one or more C_2 to C_5, saturated or unsaturated hydrocarbons, and wherein the second hydrocarbon feed comprises a second refinery gas stream comprising one or more C_2 to C_5, saturated or unsaturated, hydrocarbons, and wherein a composition of

the first hydrocarbon feed and a composition of the second hydrocarbon feed are the same or different with respect to one another.

12. The process of any of claims 1 to 7, wherein the first hydrocarbon feed comprises primarily ethane, propane, or a mixture thereof, and wherein the second hydrocarbon feed comprises a refinery gas stream comprising one or more C_2 to C_5, saturated or unsaturated, hydrocarbons.

13. The process of any of claims 1 to 5, wherein a composition of the first hydrocarbon feed and a composition of the second hydrocarbon feed are the same.

14. The process of any of claims 1 to 13, wherein the firebox is free of any dividing wall disposed between the first segment and the second segment.

15. The process of any of claims 1 to 13, wherein the firebox comprises at least one dividing wall disposed between the first segment and the second segment.

16. The process of any of claims 1 to 15, further comprising:

stopping introduction of the first hydrocarbon feed into the one or more radiant coils disposed within the first segment of the firebox while maintaining introduction of the second hydrocarbon feed into the one or more radiant coils disposed within the second segment of the firebox; and

introducing a decoking feed comprising steam into the one or more radiant coils disposed within the first segment of the firebox to remove at least a portion of any coke deposited on an inner surface of the one or more radiant coils.

17. The process of any of claims 1 to 16, wherein, when any uncombusted fuel causes a reduced coil outlet temperature for the first steam cracker effluent, the feed rate of the first hydrocarbon feed introduced into the one or more radiant coils disposed within the first segment is reduced, at least in part, due to an effluent temperature control target without the amount of fuel input to each of the one or more burners in the first and second segments increasing.

18. A system for steam cracking one or more hydrocarbon feeds, comprising:

a steam cracker comprising a firebox having one or more radiant coils and one or more burners disposed within a first segment of the firebox and one or more radiant coils and one or more burners disposed within a second segment of the firebox, wherein:

the one or more radiant coils in the first segment are configured to receive a first hydrocarbon feed via a first feed control valve and produce a first steam cracker effluent having a first coil outlet temperature,

the one or more radiant coils in the second segment are configured to receive a second hydrocarbon feed via a second feed control valve and produce a second steam cracker effluent having a second coil outlet temperature,

the one or more burners in the first and second segments are configured to operate at substantially the same firing rate such that an amount of heat produced by each of the one or more burners in the first and second segments is substantially the same, and

the first and second feed control valves are configured to independently adjust a feed rate of the first and second hydrocarbon feeds introduced into the one or more radiant coils in the first and second segments, respectively, to independently adjust the first and second coil outlet temperatures of the first and second steam cracker effluents, respectively.

19. The system of claim 18, wherein the first segment comprises a plurality of burners, wherein at least one burner in the plurality of burners is configured to be shut down during operation while maintaining operation of at least one burner in the plurality of burners at substantially the same firing rate as the one or more burners in the second segment.

20. The system of claim 18 or claim 19, wherein the firebox is free of any dividing wall disposed between the first segment and the second segment.

21. The system of claim 18 or claim 19, wherein the firebox comprises at least one dividing wall disposed between the first segment and the second segment.

22. The system of any of claims 18 to 21, wherein:

the first and second feed control valves are configured to periodically close at different times with respect to one another to stop introduction of the first and second hydrocarbon feeds, respectively,

the one or more radiant coils in the first segment are configured to receive a first decoking feed comprising steam via a first decoking control valve when the first feed control valve is closed, and

the one or more radiant coils in the second segment are configured to receive a second decoking feed comprising steam via a second decoking control valve when the second feed control valve is closed.

23. The system of any of claims 18 to 22, wherein the fire box further comprises one or more radiant coils and one or more burners disposed within a third segment of the firebox, wherein:

the one or more radiant coils in the third segment are configured to receive a third hydrocarbon feed via a third feed control valve and produce a third steam cracker effluent having a third coil outlet temperature,

the one or more burners in the third segment are configured to operate at substantially the same firing rate as the one or more burners in the first and second segments such that an amount of heat produced by each of the one or more burners in the first, second, and third segments is substantially the same.

24. The system of claim 23, wherein the firebox further comprises one or more radiant coils and one or more burners within a fourth segment of the firebox, wherein:

the one or more radiant coils in the fourth segment are configured to receive a fourth hydrocarbon feed via a fourth feed control valve and produce a fourth steam cracker effluent having a fourth coil outlet temperature,

the one or more burners in the fourth segment are configured to operate at substantially the same firing rate as the one or more burners in the first, second, and third segments such that an amount of heat produced by each of the one or more burners in the first, second, third, and fourth segments is substantially the same.