CLAIMS:

1. A method for regenerating a Claus unit in a sulfur removal complex comprising a plurality of Claus units and a smaller number of tail gas treating units (TGTUs), the method comprising the steps of:

(a) switching a feed to a regenerating Claus unit's reaction furnace to natural gas;

(b) combusting the natural gas in the reaction furnace using an approximately stoichiometric amount of oxygen;

(c) sending tail gas from the regenerating Claus unit to an in-service TGTU;

(d) once liquid sulfur is no longer produced from the regenerating Claus unit in step (b), sending the tail gas to an in-service Claus unit's reaction furnace; and

(e) adding excess oxygen to the regenerating Claus unit's reaction furnace.

2. The method of claim 1, wherein the excess oxygen is increased incrementally up to about 10%.

3. The method of claim 1, further comprising:

(f) once the tail gas from the regenerating Claus unit after step (e) contains an environmentally acceptable concentration of sulfur, sending the tail gas to an incinerator.

4. The method of claim 1, wherein the tail gas in step (d) is sent to the combustion air piping for the in-service Claus unit's reaction furnace.

5. The method of claim 1, wherein the tail gas in step (d) is sent to the air plenum for the in-service Claus unit's reaction furnace.

6. The method of claim 1, wherein the tail gas in step (d) is sent to a dedicated nozzle on the in-service Claus unit's reaction furnace.

7. A method for regenerating a single Claus unit in a sulfur removal complex comprising a plurality of Claus units and a smaller number of tail gas treating units (TGTUs), the method comprising the steps of:

combusting natural gas in a regenerating Claus units' reaction furnace with excess oxygen; and

sending resulting tail gas to an in-service Claus unit's reaction furnace;

wherein no other Claus unit or TGTU is shut down during the regeneration of the single Claus unit.