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	GASOLINE PROCESSES
Safety	
1	When preparing reformer or isomerization vessels for maintenance, do you measure the benzene content of the unit? If so, what methods and locations are monitored and what criteria are used to establish safe levels for work to begin?
2	What are your best practices concerning the potential for flash fires in dust collectors and vent drums in a reformer's continuous catalyst regenerator when performing maintenance?
3	How have you developed Integrity Operating Windows (IOWs) to follow American Petroleum Institute (API) Recommended Practice (RP) 584? How are the IOWs maintained and communicated to the operating staff?
Theme	
4	How will increased production of naphtha from light tight oil (LTOs) and Tier 3 regulations affect the economics for alkylate and reformate production? Are there other options for processing light naphtha streams?
5	Automobile manufacturers are considering requiring the use of higher octane fuels in order to meet a mandated increase in Corporate Average Fuel Economy (CAFE) standards. What strategies might you employ should demand for higher octane gasolines increase?
6	Do LTOs contain higher concentrations of nitrogen; if so, how has this higher concentration affected gasoline processing units?
7	Recognizing that on-stream factor is an important component of margin capture, what are common areas of improvement for each of the gasoline processing units to reduce downtime or increase turnaround interval?
EPA Regs	
8	How will the recently announced EPA regulations on emissions impact your refinery operation and specific technologies (FCC, hydroprocessing, Coking, CDU/VDU, Reforming, etc.)?
Alkylation	
9	Is there a limit on the amount of time that acid can remain stagnant in the reaction section of an alkylation unit? What adverse affects may occur if this limit is exceeded? What issues could arise on a restart from a stagnant-acid condition?
10	Where is carbonyl sulfide found in alkylation units? What effects can it have on the unit and what are the prevalent management strategies?
11	What operating variables lead to increases in organic fluorides in LPG product streams in a hydrofluoric (HF) acid alkylation unit? What operating variables lead to increases in organic sulfates in sulfuric acid alkylation units and where do these compounds concentrate?
12	What are your best practices for maintaining good reliability of pH analyzers in sulfuric acid alkylation service?
13	Is it a common or recommended practice for you to change out all HF alkylation unit pump seals during turnarounds? What strategies do you employ to improve pump seal life in these services?

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Sulfuric Acid Regen	
14	What do you consider when evaluating options for sulfuric acid regeneration? Comment on owned and operated facilities, on-site third party, and off-site third party operations.
Mercaptan Removal	
15	What are your options for processing of disulfide oil from an extractive mercaptan removal unit? How will this oil affect a naphtha hydrotreater?
16	Do you plan to utilize a mercaptan removal unit in conjunction with a gasoline selective hydrotreater to meet Tier 3 gasoline sulfur requirements?
Reforming	
17	What considerations should you make when contemplating changing catalyst suppliers from the original unit licensor?
18	Due to lower product octane requirements, has your strategy for dumping and screening fixed-bed reforming catalyst changed from the standard recommendation of three years or three in-situ regenerations?
19	What is the maximum recommended nitrogen content of reformer feed for continuously regenerated units? What is its impact on chloride consumption and ammonium chloride generation?
20	What are common causes for platinum agglomeration in the catalyst of continuously regenerated reforming units and what are common solutions to address these issues?
21	What is the impact on unit performance when different qualities of hydrogen are used for the reduction step in a fixed-bed reforming unit?
22	How frequently do you change the catalyst in reforming units? What are the appropriate economic criteria to evaluate?
23	In continuously regenerated reforming units, are there valves in cyclic service that have demonstrated superior performance compared to the originally installed valves? How can maintenance of these valves have an impact on their long-term performance and reliability?
24	During the oxidation step in the regeneration of fixed-bed catalytic reformers, how does varying the length and oxygen concentration affect the unit performance?
Isom	
25	Have you detected any hydrogen chloride (HCl) slip in the stabilizer bottoms for any gasoline units (isomerization or reformer)? What are your best practices to prevent downstream unit corrosion?
26	What is your best practice for packing (material and shape) in isomerization unit off-gas caustic scrubbers?
27	What is your experience with processing benzene in C5-C6 isomerization units? Have there been any issues with higher reactor exotherms associated with benzene saturation?
Chlorides	

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28	What are your best practices for measuring chlorides in LPG streams? What criteria do you use to determine when to change LPG chloride treater media?

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	HYDROPROCESSING
Safety	
29	What are the likely causes for temperature excursion events in a hydrogen plant?
30	What factors influence your decision to conduct air versus inert reactor entry for catalyst changeout? For air entry, what methods doyou use to avoid stress corrosion cracking?
31	What are your current safe practices for sour water monitoring? What are your preferred analytical methods/sampling frequency used to measure NH3/NH4HS?
Feed Poisons and Fouling	
32	What is your suggested minimum temperature required to achieve adequate metals removal in the de-metalization catalyst to protect primary treating catalyst in FCC and hydrocracker pretreaters?
33	Phosphorus-based chemicals are used to neutralize naphthenic acids. Drilling and completion fluids also can contain phosphorus, so it may be in crude oil. What are your best practices to protect active hydrotreating catalyst from phosphorus poisoning?
34	Hydroprocessing reactor pressure drop can increase due to feed particulates, corrosion byproducts and polymerization reactions. How can bed design and loading method be optimized to avoid pressure drop limiting the cycle length or throughput?
Hydrocracking Catalysts	
35	What important parameters do you consider in designing a post treat bed for a hydrocracker? What are the advantages and disadvantages between Type I and Type II catalyst when used as a post treat bed in a hydrocracker?
36	What has been your experience regarding selectivity and activity when using regenerated hydrocracking catalysts versus fresh catalysts? How do results vary with catalyst type, unit objectives, and conversion targets?
Hydrocracking Process	
37	What are some strategies of your strategies to manage gas oil streams during outages of conversion units for refiners with vacuum gas oil hydrocracking and FCC units?
38	What are your concerns with processing FCC heavy cycle oil or slurry in a hydrocracker unit?
39	In terms of hydrocracking, what different definitions of conversion do you use?
40	What has been your experience regarding time required for hydrocracking operations to recover from temporary poisoning by organic nitrogen in the feed? What operational changes can be made to reduce the chance of permanent deactivation?
41	How do you manage operating flexibility to maximize profits in a changing margin environment during a hydrocracker cycle?
Hydrogen	
42	Is the investment justified to convert an older hydrogen production unit from a solvent CO2 removal system to a pressure swing adsorption (PSA) system?
43	For PSA units, what are the typical inspection techniques, frequency of inspections, and issues discovered? What are the criteria for retiring an adsorber?

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Optimization	
44	What is your best practices for co-processing streams in hydrotreating units?
45	What are the recent improvements in hydroprocessing units' advanced process control? What is your experience with their reliability?
Reliability/Mechanical Integrity	
46	What are the mechanical integrity implications for reactor effluent air coolers (REAC) after experiencing high temperature exposure during emergency shutdowns or trips?
47	How does recycle compressor driver type (steam turbine vs. electric motor) affect compressor availability in hydroprocessing units? How reliable are variable speed drives?
Start-Up	
48	What is your experience on bringing hydrocracking catalyst online without ammonia attenuation? Are there alternative methods or technologies to temper catalyst activity without adding ammonia?
49	Each hydroprocessing unit has an optimum strategy for full load catalyst replacement - oxidized vs. pre-sulfided. How does the strategy change for a partial reload (e.g. top bed skim or replacement)? Are there other situations when pre-activation is justified?
Tier III	
50	How is your company planning to meet Tier 3 gasoline regulations?
ULSD	
51	What is your best method to monitor salt level in a diesel salt dryer? What are your guidelines for salt usage and capacity? What are your best practices for loading and monitoring salt dryer performance?
52	What approaches are effective for you to reduce aromatic levels in ULSD product streams?

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	CRUDE/VACUUM DISTILLATION & COKING
Safety	
53	What are your best practices used to minimize the time needed to prepare a crude storage tank for safe entry?
54	What are your options and best practices for routing liquids in a desalter pressure relief scenario? If routed to crude fractionator, how should one avoid damage caused by water?
Desalting/WWTP	
55	What strategies do you employ to purge solids from recovered oil at the Waste Water Treatment Plant to avoid recycling solids back to the crude unit?
Crude Distillation	
56	Light slop oils are frequently collected and routed back to the crude unit with fresh crude. In a capacity limited crude unit, this results in backing down crude rate. What are your considerations for injecting slop/recovered oils into process units that avoid backing out crude feed?
Desalter	
57	What are the desalter conditions that may require acidification? If needed, what types of acids do you use and what issues arise downstream?
WWTP	
58	What issues have you seen in your waste water treatment plant caused by crudes containing biocides? If so, what parameters have you established to control these effects?
Crude Preheat	
59	What is your experience with hot preheat train and heater fouling attributed to waxy crudes? What methods can be used to identify fouling that is specific to wax in crudes?
Crude Distillation	
60	Please describe your experience with the occurrence of phosphorus and barium fouling in the distillate section of the crude tower. What steps have you taken to identify and mitigate the problem?
61	What are the advantages and disadvantages of pre-flash/pre-topping columns in crude units in terms of operational flexibility to process different API crudes? Please comment on overall energy efficiency and reliability (corrosion).

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Vacuum Distillation	
62	When increasing the vacuum tower cut point, what measures have you employed to mitigate the impact of chlorides in the overhead, diesel or light vacuum gas oil sections of the vacuum tower?
Vacuum Distillation/Coker	
63	What type of facilities have you used to cool hot vacuum residue going to storage to avoid plugging problems and facilitate reprocessing?
Coker	
64	What are acceptable make-up water streams that can be used for coke cutting that will not affect the coke quality?
65	Discuss operating conditions and economic drivers to produce maximum diesel from the coker.
66	Concerning new regulations for lower coke drum pressure prior to opening, what changes will you make?
Town Hall Discussion Breakout	
A	Assay vs. Real World Constraints
B	Turnaround Strategies Crude and Coking
C	Finding the Sweet Spot
D	Experiences in New Crude Oil Contaminants

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	FCC
Safety	
67	The industry continues to experience process safety incidents associated with FCC electrostatic precipitators. What are you doing to prevent these incidents?
68	How does your organization share operational and process safety information to foster an environment of continuous improvement?
69	What criteria do you follow to decide installation of remote operated isolation valves to arrest loss of containment from vessels, column bottoms, etc.? Do you recommend any safeguards to avoid spurious activation of these remote operated valves?
Environmental	
70	With environmental regulations becoming more stringent on FCC Stack emissions what are your available options to achieve the required level of SOx and NOx emissions?
71	Describe your practices for minimizing flaring and flue gas emissions during startup, shutdown and malfunction operations?
Process	
72	The FCC is LPG constrained and the refinery is octane short. What are your suggested options to increase FCC gasoline octane while minimizing any associated increase in LPG yield?
73	Octane may become an issue as refiners increase severity on the FCC gasoline post treatment units. What are your options available to address octane debits?
74	For a unit targeting low vapor pressure gasoline, which variables have the greatest impact on isopentane production?
75	What do you recommend to either prevent the formation of carbonyl sulphide or to remove it from the propylene stream? At what level does this become a concern?
76	What has been your experience with respect to FCC flue gas analyzers using tunable diode lasers or alternatives? Any specific advantages of tunable diode laser analyzers with respect to installation, operational service requirements & reliability?
77	When relying primarily on FCC feed pretreating to meet FCC gasoline sulfur specifications (current or future Tier III), how do you manage feed pre-treater outages?
Catalyst	
78	Under what conditions do gasoline sulfur reduction additives and catalysts reduce sulfur in gasoline, and by how much? What is the lowest gasoline sulfur level for which the gasoline sulfur reduction products are effective? At this gasoline sulfur level, please quantify the gasoline sulfur reduction and the amount of additive/catalyst required.

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79	For units that have experienced elevated losses leading to coarse inventory, what options exist to improve catalyst properties during turnaround? Describe your experience with purchasing external or classifying spent catalyst?
80	What are your best practices to address increased levels of conventional and "new" metals (V, Ni, Fe, Ca, Cu etc.) in the FCC that come from Tight Oil processing in the refinery?
81	Under what conditions is iron on FCC catalyst mobile, and how does this affect catalyst performance?
Reliability	
82	What are typical and max targets for FCC unit main fractionator bottoms and wet gas scrubber water for wt.% solids? Also, what are typical for pounds per barrel of catalyst losses to each and particle size distributions?
83	Can a slurry pump run at or below 1,000 rpm? If not, what is the lowest speed to minimize pump erosion?
84	What operating condition and equipment monitoring have you been practicing to avoid sulfidation corrosion problems in main fractionator bottoms circuits? What guidelines have you established? How does sulfur type contribute to these guidelines?
85	What operating practices or technology upgrades are you using to manage coking in the reactor overhead line at the main fractionator inlet?
86	With more refiners upgrading to packing in the reactor stripper, what has been your experience with reliability? When do you consider removing packing for inspection during turnaround? How much of the packing does one spare?
87	What has been your experience with gas and/or catalyst bypassing behind monolithic refractory linings? What are the possible approaches to prevent or correct this issue?
88	Describe your approach to repair and improvement (i.e. materials, design, installation, anchors) to areas that have seen repeated refractory failures?
89	For an equipment revamp/replacement, what are the factors you consider when choosing between hot-wall and cold-wall refractory design, including advantages and disadvantages of each?
90	We are planning to purchase a new flue gas steam generator. What is your preferred configuration? What are the critical operating parameters you employ to ensure reliable operation? What is your sparing philosophy?
91	What are your top 3 causes of unit slowdowns and what is the loss in on-stream factor for each? Please provide the same information for your top 3 causes of unit shutdowns?

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