New Jersey Chemical Sector
Inherently Safer Technology Checklist

Company Name, DIFF #		
Local Name		
Person(s) Interviewed, Title		
Department Reviewer, Date		

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	YES	NO	Comments
1. Did the owner/operator (o/o) complete an IST review? List the date the IST review was completed._____			
2. What methodology or technique did the o/o use to perform the IST review? (checklist or process hazard analysis)_____ _____			
3. Did the o/o review the entire EHS covered process (i.e. transportation, EHS raw material receipt and handling, storage, process equipment, treatment, product shipment)?			

	YES	NO	Comments
4. Did the o/o consider and address the following risk reduction strategies for the EHS covered process? (The level of risk reduction increases from the procedural level to the inherent level. The intent of the Inherently Safer Technology review is that each stationary source will incorporate the highest level of practical risk reduction.)			
A. Inherent:			
i. Reducing the amount of EHS material that potentially may be released?			
ii. Substituting less hazardous materials?			
iii. Using EHSs in the least hazardous process conditions or form?			
iv. Designing equipment and processes to minimize the potential for equipment failure and human error?			
B. Passive (means minimizing the hazard by process and equipment design features that reduce either the frequency or consequence of the hazard without the active functioning of any device)?			
C. Active (means using controls, safety interlocks, and emergency shutdown systems to detect and correct process deviations; e.g., a pump that is shut off by a high level switch in the downstream tank when the tank is 90% full. These systems are commonly referred to as engineering controls)?			
D. Procedural (means using operating procedures, administrative checks, emergency response, and other management approaches to prevent incidents, or to minimize the effects of an incident; e.g., hot-work procedures and permits. These approaches are commonly referred to as administrative controls)?			

	YES	NO	Comments
5. Did the o/o identify any IST alternatives or risk reduction measures (inherent, passive, active, or procedural) for the process?			
6. Did the o/o determine any identified IST alternatives or risk reduction measures to be infeasible (not practicable or impractical)? (See Attachment 1 for guidance on the determination of feasibility.)			
A. List the IST alternatives or risk reduction measures determined to be infeasible on Attachment 1.	See Attachment 1.		
B. For each IST alternative or risk reduction measure listed as infeasible, did the o/o provide the basis for the determination?			
i. Describe the o/o's basis for the determination that implementation of IST alternatives or risk reduction measures is infeasible on Attachment 1.	See Attachment 1.		
7. Did the o/o identify past IST alternatives or risk reduction measures (inherent, passive, active, or procedural) that have already been incorporated into the current process?			
A. List the past incorporated IST alternatives or risk reduction measures on Attachment 2.	See Attachment 2.		
8. Did the o/o recommend any IST alternatives or risk reduction measures to be implemented?			
A. Did the o/o provide a schedule for implementation of recommended IST alternatives?			
B. List on Attachment 3.	See Attachment 3.		

	YES	NO	Comments
9. Was the IST review conducted by a qualified expert in chemical process safety? (Although there is no definition of "qualified expert," it is expected that the o/o will use a team to perform the IST review comprised of members with expertise in chemistry, engineering, process controls and instrumentation, maintenance, production and operations, and chemical process safety.) List the team members, position, and affiliation.			
10. Did the o/o prepare a report for the IST review with supporting documentation that addresses items 3. through 9. above?			

Attachment 1 - IST or Risk Reduction Measures Determined to be Infeasible

The Best Practices Standard requires that the IST review must include an analysis of whether adoption of IST alternatives is practicable and the basis for any determination that implementation of IST is impractical. To interpret "practicable and the basis for any determination that implementation of IST is impractical," the Department will use the definition of "feasibility" provided in guidance provided by the Contra Costa County, California Health Services to implement their Industrial Safety Ordinance Code Chapter 450-8. Feasible is defined as *" . . . capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors."*

To assist in the determination of whether an IST alternative is feasible, consider the following guidance provided from the Contra Costa Health Services on feasibility, which modifies Federal OSHA guidance (OSHA provided guidance for justifiably declining recommendations from incident investigations in the September 1994, OSHA Instruction CPL 2-2.45A CH-1. These criteria have since been applied to recommendations formulated during PHA's.) and the U.S. EPA:

1. The analysis upon which the recommendations are based contains factual errors.
2. The recommendation is not necessary, i.e., the safeguards may be inadequate, but the consequences are operational or the consequence or severity of the scenario would not result in a significant onsite or offsite risk.
3. An alternative IST would provide a sufficient level of hazard reduction (NOTE: Implementing only one option to address identified hazards may not be adequate to address the greatest hazard reduction or elimination. However, it is not necessary to implement more than one IST if the implementation of a second IST does not add any significant hazard reduction or has been documented as infeasible.)
4. The recommendation is in conflict with existing federal, state, or local laws.
5. The recommendation is in conflict with Recognized and Generally Accepted Good Engineering Practices (RAGAGEP).
6. The recommendation is economically impractical, such that the process unit can no longer be financially operated. This can include the following factors:
   A. Capital investment
   B. Product quality
   C. Total direct manufacturing costs
   D. Operability of the plant
   E. Demolition and future clean-up and disposal cost
7. The recommendation would have a negative social impact such that the project should not be implemented. Some examples of social impact include the recommendation would have a visual or noise impact on the community that is not acceptable and the recommendation would cause or increase the traffic congestion.
8. The recommendation may violate a license agreement and the license agreement cannot be modified and must remain in effect.
9. The recommendation may decrease the hazard, but would increase the overall risk.
10. An alternative measure would provide more risk reduction than the IST.

If the IST recommended is determined not to be implemented because it will create more risk, or if other modifications that are not IST are made such that the overall risk is less than if the IST were implemented, the stationary source will need to document how this determination was made. A qualitative risk assessment/analysis could be used as a basis for the risk analysis. The facility needs to document how they determined the qualitative severity and likelihood for the existing or modified conditions and for the conditions if the IST is implemented. If the qualitative risk analysis shows the same level of risk, then a quantitative risk assessment/analysis should be performed to compare the risk of the existing or modified conditions to the risk if the IST is implemented. The documentation should include the background information that was used to do the comparison of the existing or modified conditions to the conditions if the IST is implemented. Another method may be used by the stationary source, such as a weighted scoring decision matrix as shown on page 23 of the CCPS book Inherently Safer Chemical Process: A Life Cycle Approach.

Attachment 1 - IST or Risk Reduction Determined to be Infeasible

	Risk Reduction Strategy	Description of IST Alternative or Risk Reduction Measure	Basis for Determination to be Infeasible
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Attachment 2 - Past IST Alternatives or Risk Reduction Measures Incorporated into the Process

	Risk Reduction Strategy	Description of IST Alternative or Risk Reduction Measure
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Attachment 3 - IST Review Recommendations and Implementation Schedule

	Risk Reduction Strategy	IST Alternative or Risk Reduction Recommendation	Scheduled Due Date
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