

NC Job Risk Assessment

| | | | | | | |
|---|---|---|-------------------|------------|--------------------|-------------------------------|
| Name(s) of Risk Team Members: L. Davis, D. Elling, R. Sabatini | Point Value Parameter → ↓ | 1 | 2 | 3 | 4 | 5 |
| Job Title: <i>Work with chemicals in laboratories</i> | Frequency (B) | ≤once/year | ≤once/month | ≤once/week | ≤once/shift | >once/shift |
| Job Number or Job Identifier: NC-JRA-003 | Severity (C) | First Aid Only | Medical Treatment | Lost Time | Partial Disability | Death or Permanent Disability |
| Job Description: Handling chemicals with the following hazards: Carcinogens, Highly acute Toxin, Reproductive toxins, Corrosives, Strong Oxidizers, Highly Reactive Materials, Perchlorates, Oils, Explosives, Peroxide forming, Pyrophoric Materials | Likelihood (D) | Very Unlikely | Unlikely | Possible | Probable | Multiple |
| Training Procedures List (Optional): | | | | | | |
| Approved by: R. Sabatini Date: 5/16/2011 Rev. #:1 | | | | | | |
| Stressors (if applicable, please list all) (1) Environmental; (2) Temperature; (3) Time restraints | | Reason for Revision (if applicable): As required 3-yr cycle | | | Comments: | |

| Job Step/Task | Hazard | Control(s) | Before Additional Controls | | | | | Control(s) Added to Reduce Risk | After Additional Controls | | | | | % Risk Reduction | |
|----------------------|---|---|----------------------------|---------------|-------------|------------|--------------|---------------------------------|---------------------------|-----------|---------------|-------------|------------|------------------|--------------|
| | | | Stressor | # of People A | Frequency B | Severity C | Likelihood D | | Risk* AxBxCxD | Stressors | # of People A | Frequency B | Severity C | | Likelihood D |
| 1. Storing Chemicals | Fire; Explosion; spill; chemical reactions; exposure via inhalation to vapors, mists, dusts | Segregation of hazard types; flammable and acid cabinets; guidance in Working with Chemicals Subject Area; CMS; work planning procedures; PPE; area monitoring; ventilation; secondary containment; spill response; use of safer substitutes; Tier 1 inspections; container labeling; area posting; shelf-life monitoring; containers specific for the hazard and operation; controlled atmosphere (glove box) | N | 1 | 4 | 3 | 1 | 12 | | | | | | | |
| 2. Moving containers | spillage via tripping/dropping; | guidance in Working with Chemicals Subject Area CMS; work planning | N | 1 | 5 | 3 | 2 | 30 | | | | | | | |

NC Job Risk Assessment

| Job Step/Task | Hazard | Control(s) | Before Additional Controls | | | | | | Control(s) Added to Reduce Risk | After Additional Controls | | | | | |
|---|--|---|----------------------------|---------------|-------------|------------|--------------|---------------|---------------------------------|---------------------------|---------------|-------------|------------|--------------|---------------|
| | | | Stressor | # of People A | Frequency B | Severity C | Likelihood D | Risk* AxBxCxD | | Stressors | # of People A | Frequency B | Severity C | Likelihood D | Risk* AxBxCxD |
| within the lab | explosion with exposure to vapors, mists, dusts | procedures; PPE; area monitoring; personnel monitoring; secondary containment; spill response; hazardous and radioactive waste controls; Tier 1 inspections; container labeling; containers specific for the hazard and operation | | | | | | | | | | | | | |
| 3. Measuring chemicals-pipeting; balances; filling sample cells, etc. | spillage; exposure to vapors, mists, dusts | guidance in Working with Chemicals Subject Area; CMS, work planning procedures; PPE; area monitoring; personnel monitoring; use of small volumes; ventilation; secondary containment; spill response; fume hoods/glove box; use of safer substitutes; Tier 1 inspections; container labeling; area posting; containers specific for the hazard and operation | N | 1 | 4 | 3 | 3 | 36 | | | | | | | |
| 4. Mixing, reacting; & synthesizing hazardous substances | uncontrolled reactions; exothermic reaction; explosions; exposure to vapors, mists, dusts; creation of unknown hazards | guidance in Working with Chemicals Subject Area; CMS, work planning procedures; PPE; area monitoring; personnel monitoring; use of small volumes; ventilation; secondary containment; spill response; use of safer substitutes; container labeling; area posting; reactions vessels designed specific for the hazard | Y | 1 | 3 | 3 | 3 | 27 | | | | | | | |
| 5. Distilling & rotovap of hazardous substances | uncontrolled reactions, exothermic reaction, exposure to vapors, mists, dusts | guidance in Working with Chemicals Subject Area; CMS, work planning procedures; PPE; area monitoring; personnel monitoring; use of small volumes; ventilation; secondary containment; local exhaust spill response; use of safer substitutes; Tier 1 inspections; container labeling; area posting; reactions vessels designed specific for the hazard | Y | 1 | 3 | 3 | 3 | 27 | | | | | | | |
| 6. Analysis by instrumentation such as HPLC, GC, ICP, AA, MS, electrodes, thermometer | exposure to vapors, mists, dusts | guidance in Working with Chemicals Subject Area; CMS, work planning procedures; PPE; area monitoring; personnel monitoring; use of small volumes; ventilation; secondary containment; spill response; use of safer substitutes; container labeling; area posting; containers specific for the hazard and operation | N | 1 | 2 | 1 | 2 | 4 | | | | | | | |

NC Job Risk Assessment

| Job Step/Task | Hazard | Control(s) | Before Additional Controls | | | | | | Control(s) Added to Reduce Risk | After Additional Controls | | | | | % Risk Reduction |
|---|---|--|----------------------------|---------------|-------------|------------|--------------|---------------|---------------------------------|---------------------------|---------------|-------------|------------|--------------|------------------|
| | | | Stressor | # of People A | Frequency B | Severity C | Likelihood D | Risk* AxBxCxD | | Stressors | # of People A | Frequency B | Severity C | Likelihood D | |
| 7. Inhalation of fugitive by-products | Inhalation, skin exposure of hazardous gases | Training, use of fume hoods, glove box and exhausted equipment, PPE | N | 1 | 5 | 3 | 2 | 30 | | | | | | | |
| 8. Handling, storing, testing, and distilling <i>peroxide forming compounds</i> | rupture of container; exposure to vapors; explosion; spillage via tripping/dropping; | Periodic testing as per SBMS WWC; CMS, work planning & ESR, procedures; PPE; area monitoring; personnel monitoring; use of small volumes; ventilation; secondary containment; spill response; use of safer substitutes; Tier 1 inspections; container labeling; shelf-life monitoring; containers specific for the hazard and operation | Y | 1 | 2 | 3 | 2 | 12 | | | | | | | |
| 9. Handling, storing, testing <i>pyrophoric compounds, fine powders</i> | rupture of container; exposure to vapors; dust, mists, fumes; fire; spillage via tripping/dropping; | guidance in Working with Chemicals Subject Area; CMS, work planning procedures; PPE; area monitoring; personnel monitoring; use of small volumes; ventilation; secondary containment; spill response; use of safer substitutes; Tier 1 inspections; container labeling; shelf-life monitoring; containers specific for the hazard and operation, proper extinguisher media (Class D), awareness of static electricity potential. | Y | 1 | 2 | 3 | 3 | 18 | | | | | | | |
| 10. Handling, storing, testing <i>sensitizers & acute toxins</i> | exposure to vapors; dust, mists, fumes; fire; spillage via tripping/dropping; | guidance in Working with Chemicals Subject Area; CMS, work planning & ESR, procedures; PPE; area monitoring; personnel monitoring; use of small volumes; ventilation; secondary containment; spill response; use of safer substitutes; Tier 1 inspections; container labeling; area posting; containers specific for the hazard and operation | Y | 1 | 2 | 5 | 2 | 20 | | | | | | | |
| 11. Transporting of chemicals to other locations within a building | spillage via tripping/dropping;; exposure to vapors, mists, dusts | work planning procedures; PPE; use of small volumes; secondary containment; spill response; use of safer substitutes; container labeling; containers specific for the hazard and operation, SBMS Transportation, Chemical Control Areas | N | 1 | 3 | 3 | 2 | 18 | | | | | | | |

NC Job Risk Assessment

| Job Step/Task | Hazard | Control(s) | Before Additional Controls | | | | | Control(s) Added to Reduce Risk | After Additional Controls | | | | | % Risk Reduction | |
|--|--|--|----------------------------|---------------|-------------|------------|--------------|---------------------------------|---------------------------|-----------|---------------|-------------|------------|------------------|--------------|
| | | | Stressor | # of People A | Frequency B | Severity C | Likelihood D | | Risk* AxBxCxD | Stressors | # of People A | Frequency B | Severity C | | Likelihood D |
| 12. Transporting of chemicals to other locations outside a building but within BNL | spillage via tripping/dropping; exposure to vapors, mists, dusts | Small quantities, PPE, secondary containment | N | 1 | 2 | 2 | 2 | 8 | | | | | | | |
| 13. Transporting of chemicals to other locations outside of BNL | spillage via tripping/dropping; exposure to vapors, mists, dusts | See SBMS subject area, DOT Shipping | N | 1 | 2 | 2 | 2 | 8 | | | | | | | |

| | | | | | |
|---------------|-------------------|-------------------|-----------------|--------------------|----------------------|
| *Risk: | 0 to 20 | 21 to 40 | 41-60 | 61 to 80 | 81 or greater |
| | Negligible | Acceptable | Moderate | Substantial | Intolerable |