OVERVIEW OF ISO 14001:2015

Day 2 – Planning

NORTH CAROLINA
Department of Environmental Quality

NC Environmental Stewardship Initiative

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PLANNING

Section 6.1 Actions to Address Risks and Opportunities

6.1.1, 6.1.2, 6.1.3, 6.1.4

Section 6.2 Environmental Objectives and Planning to Achieve Them

6.2.1, 6.2.2

6.1.1 General

- Organization ***shall*** establish, implement, and maintain the process(es) needed to achieve the desired outcomes and the requirements of this standard
- When planning the EMS, the organization ***shall*** consider:
  - Context determined in 4.1
  - Compliance Obligations defined in 4.2
  - Scope of the EMS defined in 4.3
- When planning the EMS, the organization ***shall*** determine risks and opportunities related to:
  - Environmental aspects defined in 6.1.2
  - Compliance obligations defined in 6.1.3
  - Other issues and requirements identified in 4.1 & 4.2 that need to be addressed to:
    - ✓ Give assurance the EMS can achieve its intended outcomes
    - ✓ Prevent or reduce undesired effects
    - ✓ Achieve continual improvement

Risks & Opportunities

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3.2.11 – Definition - **Risks and Opportunities**

Potential adverse effects (threats) and potential beneficial effects (opportunities)

From the annex (A.6.1.1):

The organization can also have risks and opportunities related to other issues, including environmental conditions or needs and expectations of interested parties, which can affect the organization's ability to achieve the intended outcomes of its environmental management system, e.g.

a) environmental spillage due to literacy or language barriers among workers who cannot understand local work procedures;

b) increased flooding due to climate change that could affect the organizations premises;

c) lack of available resources to maintain an effective environmental management system due to economic constraints;

d) introducing new technology financed by governmental grants, which could improve air quality;

e) water scarcity during periods of drought that could affect the organization's ability to operate its emission control equipment.

Risks & Opportunities

- Not every risk and opportunity is required to be included. There must be a connection to the environmental management system.
  - Ex. hazardous waste disposal risks has an obvious connection to the EMS; credit card fraud risks do not.
- Like LCA, a formal risk assessment is not required, but risks & opportunities must be documented.
- Ex:
  - Compliance Violation
    - ✓ Risks: Legal Action, Fines, Marred Reputation
  - Going Beyond Compliance
    - ✓ Opportunities: Improved Reputation, Positive press, Marketing Benefits

Section: Zoowide	Environmental Aspects																		Revision #: 4	Effective Date: 12/5/2017
Number: EMS_Z_4.1.1																			Revision Date: 10/25/17	Review Date: 10/25/17
Activity, Product or Service	Aspect	Life Cycle Stage (C, NC or NA)							Impact	Severity	Frequency	Quantity	Impact Rank	Management Control (Y or N)	Effectiveness (0-3)	Compliance Obligation (Y or N)	Significant (Y or N)	If significant, Priority	Risk & Opportunities	Controls for Significant / Aspects Impacts	Comments
		Design	Acquisition of Raw Material	Production	Transport/Delivery	Use	End-of-Life Treatment	Final Disposal													
Operations, Guest Transportation, Spill Response, and Maintenance	Fuel/Nat Resources	C	C	NA	NC	C	NC	NC	Soil & Surface Water Contamination &Depletion of Nonrenewable Resources	1	3	1	5	Y	0	N	Y	3	Opp-efficient driving Risk-old vehicle with poor mileage, spill	H3.21.0, Z3.1, EM3.3, A3.3, D3.2, Z3.2, Z3.4	
Irrigation/Manual Watering, Cleaning/Sanitizing, Animal Pools, Filtration, Operations and Maintenance	Fuel/Nat Resources	C	C	NA	NC	C	C	C	Surface Water Contamination	1	3	3	7	Y	1	Y	Y	3	Opp-automated irrigation, variable speed pumps Risk-spills, water/soil contamination	H3.22.1, H3.22.3, H3.22.15, A3.1, F3.2, F3.4, F3.7	

[redacted] Aspects and PESTLE List

Aspect	PESTLE Political, Economic, Social, Technological, Legal, Ecological)	Potential Impact (Internal & External Relevance)	Within Functional and Physical Boundary?	Needs & Expectations/ Legal Requirement	Corporate or Plant Requirement	Risks & Opportunities/ Professional Analysis	Cost to Manage >$250K/Yr	Significant Aspect?
Environmental Aspects								
Chemical Usage, Chemical Storage and Releases	Ecological Legal	Resource depletion (I/E) Discharges to Land, Water, Air (I/E) Climate Change (E) Risk Management (I) Audits (I/E)	Yes Yes Yes Yes Yes	Annual SARA Reporting – 312 Tier II and 313 Form R DOT (49CFR) EPCRA (LEPC) TSCA Training	Enter usage of SARA 313 chemicals monthly into DataStream – Corp. Internal Audits List of procedures here	(R) Significant hazards assoc. with chemicals used at both sites, Fines and Penalties (O) Purchase less hazardous chemicals, test response plans		Yes
Oil Storage – Tanks, Containers and Equipment	Ecological Legal	Discharges to Land, Water, Air (I/E) Risk Management (I) Audits (I/E)	Yes Yes Yes	SPCC - Annual Review and update of plan as needed, monthly inspections of oil spill containers Training	Internal Audits List of procedures here	(R) Significant hazards assoc. with releases, Fines and Penalties (O)		No
Energy Usage	Ecological Legal	Resource depletion (I&E) Operating Cost (I) Air emissions (I/E) Climate Change (E) Audits (I/E)	Yes Yes Yes No Yes	Not regulated except that air emissions from direct usage of natural gas are regulated (see Outputs: Air Emissions)	Corporate goal to reduce greenhouse gas emissions by 25% by 2020; required to enter usage monthly into DataStream – Corp. List of procedures here	(R) High utility cost (O) Potential energy reductions through lighting changes, chiller and HVAC upgrades (KM only), improved compressed air leak detection		Yes
Municipal Water	Ecological Social	Resource depletion (I/E)	Yes	Not Regulated	Track and Enter into Data Stream monthly – Corp. List of procedures here	(R) Low impact (O)		No
Land	Ecological Social	Natural habitat reduction (I/E) Adjacent Businesses and Residents (E)	No Yes	Not regulated Maintain: WHC Conservation Certification (KM)	Sites are encouraged to develop habitat areas and develop success environmental management programs – Corp List of procedures here	(R) Losing Certification (O) Source of pride for company and plant. High value for creating relationships with community		Yes

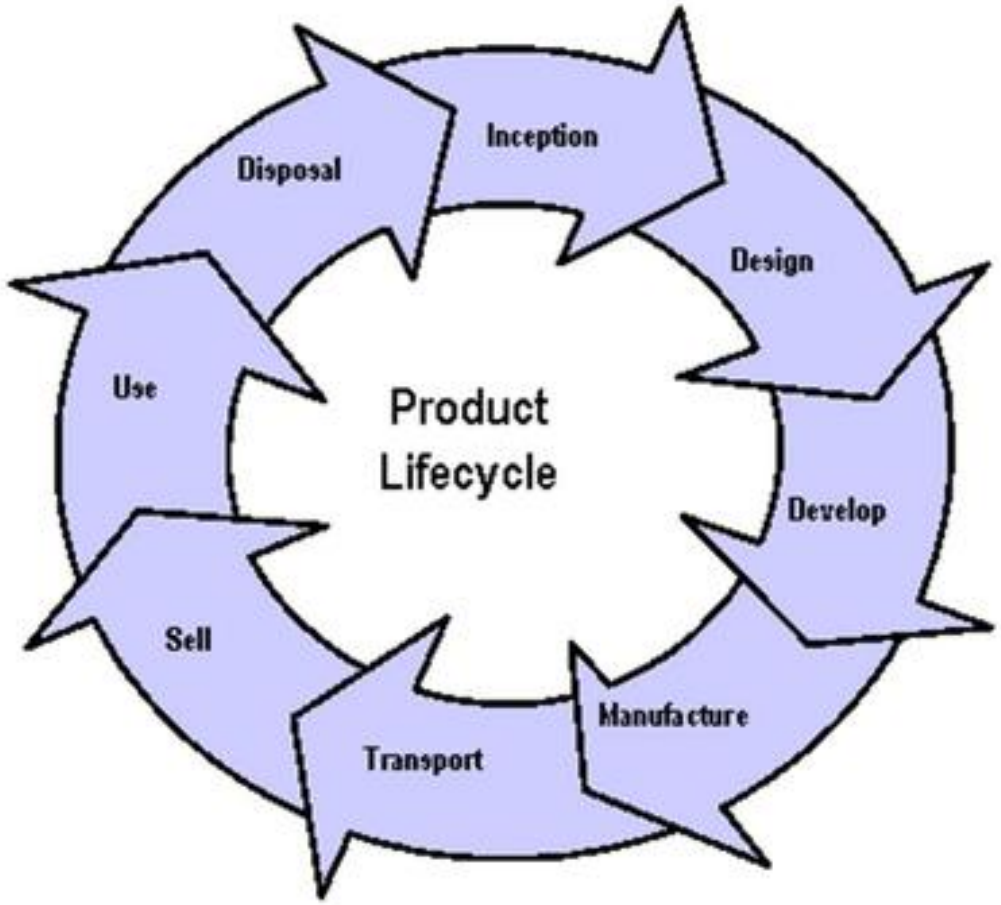
6.1.1 General (cont'd)

- Organization ***shall*** determine potential emergency situations, including those that can have an environmental impact (8.2)
- Organization ***shall*** maintain ***documented information*** on its:
  - Risks and opportunities that need to be addressed
  - Process(s) needed in 6.1.1 and 6.1.4 to have confidence they are carried out as planned

6.1.2 Environmental Aspects

- Organization ***shall*** determine environmental aspects and their associated impacts considering a life cycle perspective
- When determining aspects the organization ***shall*** take into account:
  - Change
    - ✓Planned or new developments
    - ✓New or modified activities, products, services
  - Abnormal conditions
  - Reasonably foreseeable emergency situations

Life Cycle Perspective



Typical Stages:

- Design
- Raw Material Acquisition
- Production
- Transportations/Delivery
- Use
- End-of-Life Treatment
- Disposal

Design Considerations

- Raw materials needed
  - Renewable resources?
  - Reduced need for Hazardous Materials?
  - Recycled content?
- Manufacturing Process
  - Additive or Subtractive (3D printing vs Material removal)
  - If Subtractive, is it optimized to remove the minimum (aka reducing material consumption)
  - Lower energy needs
- Ease of End-of-Life Treatment
  - Can materials of different types be easily separated?
  - Can the product be re-used (in whole or in part) by another process
  - Can the product be recycled/composted
- Others?

Raw Material Acquisition Considerations

- Are there less toxic materials that could be substituted?
- Could you receive items in bulk vs small packages?
- Is the packaging used on the raw materials returnable or at least recyclable?
- Does a material require a higher energy demand than a substitute?
- Does a material require a higher water demand than a substitute?
- Does the usage of a material require additional treatment (ex. wastewater pre-treatment)
- Can a material be filtered/treated and reused?
- What else?

Production Considerations

- What products are made?
- What materials are used?
- What types of wastes and discharges are generated?
- What type contractors, vendors, suppliers are on site?
- What do you do off-site (deliveries, servicing?)
- Where are you located?
- What permits/regulations do you have?
- What fuels or other energy sources are used? How much?
- How is water used in the process? And how much?
- What about wastewater?

Transportation/Delivery Considerations

- Look at products, raw materials, & wastes
- Air emissions including GHGs
- Hazardous waste spills
- Traffic accidents
- Fluid leaks (oil, hydraulics, etc.)
- Parts damaged due to shifting, packaging, corrosion, etc.
- Fork trucks (emissions, damage from forks, etc.)

Use Considerations

- How is the product used? Are there impacts?
  - Energy use?
  - Water use?
  - Waste materials?
  - Packaging?

End-of-Life Treatment & Disposal

- Can the design of the product be changed to make recycling easier (reduce composite materials, etc.)?
- Do you have a take-back program?
- Does the product inherently break down into compostable, recyclable, reusable pieces?

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Life Cycle Examples & Exercise

6.1.2 Environmental Aspects

- Organization ***shall*** determine those aspects that can have a **significant** environmental impact by using established criteria
- Organization ***shall*** communicate its **significant aspects** among the various levels and functions of the organization, as appropriate
- Organization ***shall*** maintain ***documented information*** of its:
  - Environmental aspects and impacts
  - Criteria used to determine its significant aspects
  - Significant environmental aspects

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Examples of Significance Criteria and Rating Scheme

Category	High (3)	Medium (2)	Low (1)
Scale of impact	National/global	Regional	Local
Severity of impact	Potentially life threatening or life altering to humans, flora, or fauna	Danger of non-life threatening health effects to humans, flora, or fauna	Little danger to the health of humans, flora, or fauna
Likelihood of occurrence	Almost certain to occur	Somewhat likely to occur	Not likely to occur
Duration of impact	Long term effects on the environment	Short term effects on the environment	Little effect on the environment
Frequency of occurrence of impact	Weekly to daily	Monthly to weekly	Less than monthly
Potential regulatory or legal exposure	Possible criminal action or significant fine	Notice of violation or fine	Issue not regulated or little possibility of violation
Concerns of interested parties	Frequent or high level of concern	Occasional concerns	Little to no concern

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Examples of Significance Criteria and Rating Scheme

	Severity	Frequency	Quantity
None (0)	No impact	None	None
Low (1)	Little impact to environment and/or no danger to the health of humans (visitors/neighbors) or wildlife (not zoo animals)	Less than monthly	Pounds per year
Medium (2)	Danger of non-life threatening health effects to humans or wildlife, or short term effects on the environment (reversible < 1yr)	Monthly to weekly	Tons per year
High (3)	Potentially life threatening or life altering to humans or wildlife, or significant long term effects on the environment (reversible > 1yr)	Weekly to daily	Tons per month

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Examples of Significance Criteria and Rating Scheme

- Frequency: Does this activity occur all the time?
  0 - Never Happens
  1 - Happens rarely; act of God
  2 - Happens 1 time per year
  3 - Happens quarterly
  4 - Happens more than 1 time per month
  5 - Happens continuously

- Harm: Is the activity potentially unhealthy?
  0 - No harm
  1 - Little potential for harm
  2 - Can be harmful
  3 - Moderately harmful
  4 - Extremely harmful
  5 - Potentially fatal

- Regulated: Review necessary register of legal and other requirements.
  0 - No
  5 - Yes

- Controls in Place:
  0 - Controlled
  1 - Above average controls
  2 - Average controls
  3 - Some controls
  4 - Lacking controls
  5 - No controls

6.1.3 Compliance Obligations

- Organization ***shall***
  - Determine and have access to the compliance obligations related to its environmental aspects;
  - Determine how these compliance obligations apply to the organization;
  - Take these compliance obligations into account when establishing, implementing, maintaining and continually improving its EMS
- Organization ***shall*** maintain ***documented information*** of its compliance obligations

Compliance Obligations

- Compliance obligations include legal environmental requirements that an organization has to comply with and other environmental requirements to which an organization chooses to comply.
- Compliance obligations can arise from applicable laws and regulation or voluntary commitments stemming from the needs of interested parties.

Compliance Obligations - Legal

Legal requirements can encompass a broad range of topics and can originate from many "regulatory agencies" (federal, state, local, international)

Examples:

- CAAA, CWA, RCRA, Hazardous Materials Transportation Act (HMTA), EPCRA/TRI, FIFRA, National Historical Preservation Act, NEPA/SEPA, and Endangered Species Act, Oil Spill Prevention (SPCC), etc.
- Permit requirements/limits and reporting requirements
- Executive Orders, Atomic Energy Act, Energy Policy Act
- Local restrictions (pretreatment permits, grading permits, etc.)
- Superfund or other clean-up agreements
- Operator or laboratory certification requirements

Additional Legal Requirements

- Transformers - TSCA/PCBs (energy provider responsible)
- Nursing Station - medical waste
- Grounds Irrigation - local water restrictions
- Pesticide application – NC certified applicators (aquatic additional req.)
- HVAC – certified technicians for refrigerant recovery
- Fluorescent lights – mercury/universal waste
- Computer monitors - electronics landfill ban
- Cardboard - local landfill bans
- State landfill banned materials - wooden pallets, plastic bottles, etc.

Other Compliance Obligations

Examples:

- ISO 14001 commitments
- ESI or other voluntary programs
- Business programs (e.g. Responsible Care)
- Corporate mandates
- Customer requirements (e.g. Ford, Toyota)
- Supplier requirements
- Industry standards
- Contractual agreements
- Agreements with communities or NGOs
- Voluntary labeling or environmental commitments (pollinator gardens and wildlife areas)
- Insurance/FEMA

Keeping current with changing regulations

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How will your organization keep current with changing regulations and compliance obligations?

- Subscribe to an update service or get updates from industrial trade group(s)
- Attend trainings: NCMA's EEHS, NCDEQ, EPA webinars
- Check regulatory websites
- Join regulatory listserv
- Contact a DEACS environmental assistance coordinator
- Hire a consultant
- Contact NCSU Industry Expansion Solutions
- Refer to corporate legal team
- Create a tracking/reminder system (compliance calendar, task reminders, etc.)

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Compliance Obligations:

- Who might be interested parties for this rock quarry?
- What might be their needs and expectations?
- What compliance obligations might the quarry voluntarily take on as a result of the needs and expectations of these interested parties?

Example

Compliance Obligation Title	Reg. Agency / Driver	Citation & Link	General Description of Compliance Obligation	Applicability Trigger	Environmental Aspects	Summary of Controls (SOPs, Plans, Permits, etc.)	Location of Guidance Documents & Resources	Monitoring Requirements	Date Due and Frequency of Reporting	Documents & Records Required to be Maintained
Stormwater Permit	NC DEQ DMLR	40 CFR 122.26	SDO (Storm water outfall discharge) monitoring, SW Pollution Prevention Plan, Maintain Storm water BMP (Best Management Practices)	Permit required if facility: is manufacturing SIC, has a point source discharge, stores or processes materials outside (exposed to storm water)	Stormwater runoff	NPDES Industrial Stormwater Permit, SOP of Visual Inspections, SOP of How to Sample Stormwater, Non-Stormwater Discharge Certification	SOPs and guidance documents located in main office	Qualitative monitoring, Non stormwater discharge certification, Sampling	Qualitative monitoring: twice a year, Non stormwater discharge cert: once a year, Sampling: twice a year unless above benchmarks then once a month	Keep Qualitative Monitoring records, Non-SW Discharge Certs, SW Pollution Prevention Plan, Copies of Sampling Results, Calibration and maintenance records for five years. Submit sampling results within 30 days

Risks & Opportunities Exercise

6.1.4 Planning Action

- Organization ***shall*** plan
  - To take actions to address
    - ✓Significant environmental aspects
    - ✓Compliance obligations
    - ✓Risks and opportunities identified in 6.1.1
  - How to
    - ✓Integrate and implement these actions into EMS or other business processes
    - ✓Evaluate effectiveness of these actions
- Organization ***shall*** consider when planning these actions
  - technological options
  - financial, operational and business requirements

6.2.1 Environmental Objectives

- Organization ***shall*** establish environmental objectives at relevant functions and levels, taking into account:
  - Significant environmental aspects
  - Associated compliance obligations
  - Considering its risks and opportunities
- Environmental Objectives ***shall*** be
  - Consistent with environmental policy
  - Measurable (if practicable)
  - Monitored
  - Communicated
  - Updated as appropriate
- Organization ***shall*** maintain ***documented information*** on its environmental objectives

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SMART Goals

Specific

- What do I want to achieve?
- Why do I want to achieve it?
- Where?
- How?
- When?
- Identify any requirements or restraints

Measurable

- Can you identify when you reach your goal?
- Do you have concrete evidence?
- Do you have access to the parameters of measurement?
- Have baselines been established?
- What units of measurement will you use?
- Will you normalize the data? (compared to production, time, income, etc)

Measurable (cont'd)

- Where are the metrics located?
  - Human Resources - training records
  - Purchasing – cost of contractors, negotiated contracts, cost of raw materials
  - Maintenance – preventative and repairs
  - Accounting – actual costs, paid invoices, utility bills
  - Compliance Officer- regulatory requirements
  - Production – scrap rates

Attainable

- Setting goals that are realistic and challenging can help strike a balance between aiming too high or making goals too easy. Both of these can cause a lack of interest and involvement in the process.
- Having stretch goals that take time to accomplish is different than having goals that can never be reached.
  - If they seem too large, communicate smaller steps towards a larger goal to keep interest and celebrate accomplishment at each step. (Example: ZWTL broken down into waste reduction goals each year that accumulate over time)

Relevant

- Does this goal match your company's philosophy, mission statement, policy?
- Does this goal fit in your corporate culture?
- Is it customer driven?
- Does it improve efficiency, save money or time, improve relationship with community (aka Risk & Opportunities)?

Time-bound

- Set deadlines
- Make sure they are realistic and flexible
- Do you have a way to follow up?

Set Goals to …

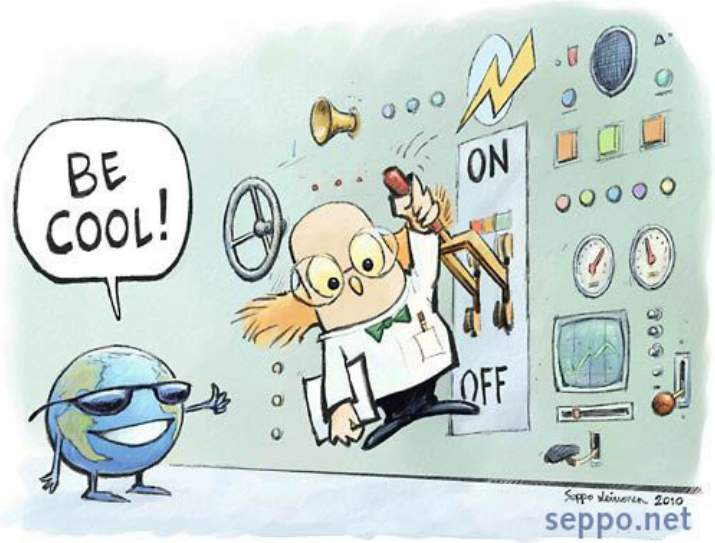
- **Investigate or Study**
  - Obj. = Study feasibility of gray water use w/ final report by 2Q 2018
- **Control or Maintain**
  - Obj. = Maintain storm water compliance w/zero violations by end of year

Set Goals to …

- **Develop an EMS**
  - Obj. = Implement an EMS w/3rd party audit Jan. 2019

- **Improve the EMS**
  - Obj. = Streamline contingency plan to make more user-friendly by year-end 2018

Set Goals to …



- **Improve environmental performance**
  - Obj. = Reduce electricity use by 10% in FY17-18 from FY 15-16 baseline
  - Obj. = Reduce natural gas use by 5% in FY 17-18 from FY 15-16 baseline

The ESI program aims for goals that seek to reduce environmental footprint

Set Goals to …

- **Improve environmental performance**
  - Obj. = Increase volume of recycled materials by 50% in calendar yr 2018 from calendar yr 2015 baseline

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More Examples

- Replace all lighting in the warehouse by end of FY2017
- Create facility level target to reduce energy consumption
- Decrease electricity use 3% from 2012 actual per part produced
- Increase recycling
- Reduce usage of natural resources
- Improve raw material utilization/waste reduction
- Process and technology improvements resulting in electrical savings
- Pollution Prevention: Reduce greenhouse gas generation by 3% (indexed to sales)
- Reduce electrical usage 10% by 2020 using 2015 as the baseline.
- Receive third party ISO14001:2015 certification by 2018.
- Divert 98% of solid waste from going to the landfill annually

6.2.2 Planning Actions to Achieve Environmental Objectives

- When planning how to achieve environmental objectives, organization ***shall*** determine:
  - What will be done
  - What resources will be required
  - Who will be responsible
  - When it will be completed
  - How the results will be evaluated (including what will be monitored – 9.1.1)
- Organization ***shall*** consider how actions to achieve objectives can be integrated into business processes

How can actions be integrated?

- Location.
  - Organization-wide or only apply to a specific department, unit, or activity.
  - It may depend on the location of significant aspects or the action step to be taken.
  - Site-wide goals increase involvement and visibility.
- Employees.
  - Involve them early.
  - All or only some employees?
  - Creating a sense of ownership helps to foster buy-in.
  - Communicate the expectations.
- Consider linking achievement of environmental goals to business goals and reward programs.

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