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Global Harmonized System (GHS) of Classification and Labeling of Chemicals

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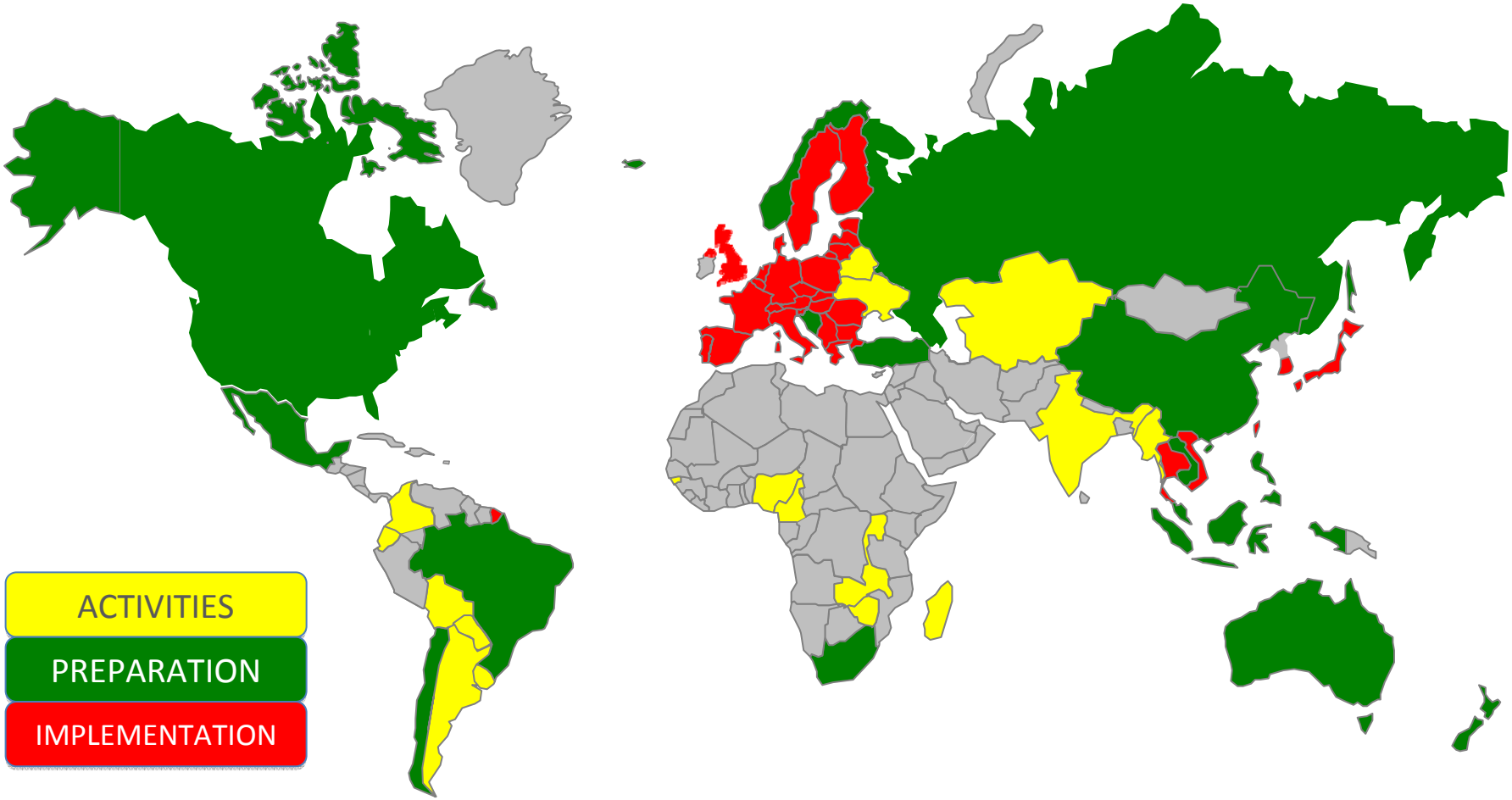
Presentation Goals

- Overview of GHS and why change HazCom (HCS)
- Compare GHS and HCS aspects
- HCS: What is expected to change
- Tips for transitioning to GHS

GHS Overview

- GHS stands for the Globally Harmonized System for the Classification and Labeling of Chemicals
- Intended to upgrade and simplify HCS worldwide
- The GHS is not a global law or regulation – it is a system or set of recommendations or “building blocks”.
- Targets:
  - Workers, consumers, transport workers, and emergency responders
- Covers:
  - Classification of hazards
  - Labeling of hazardous products
  - Safety Data Sheets (SDSs) for hazardous products
- 67 countries have implemented (or in process) GHS. http://www.unece.org/trans/danger/publi/ghs/implementation_e.html

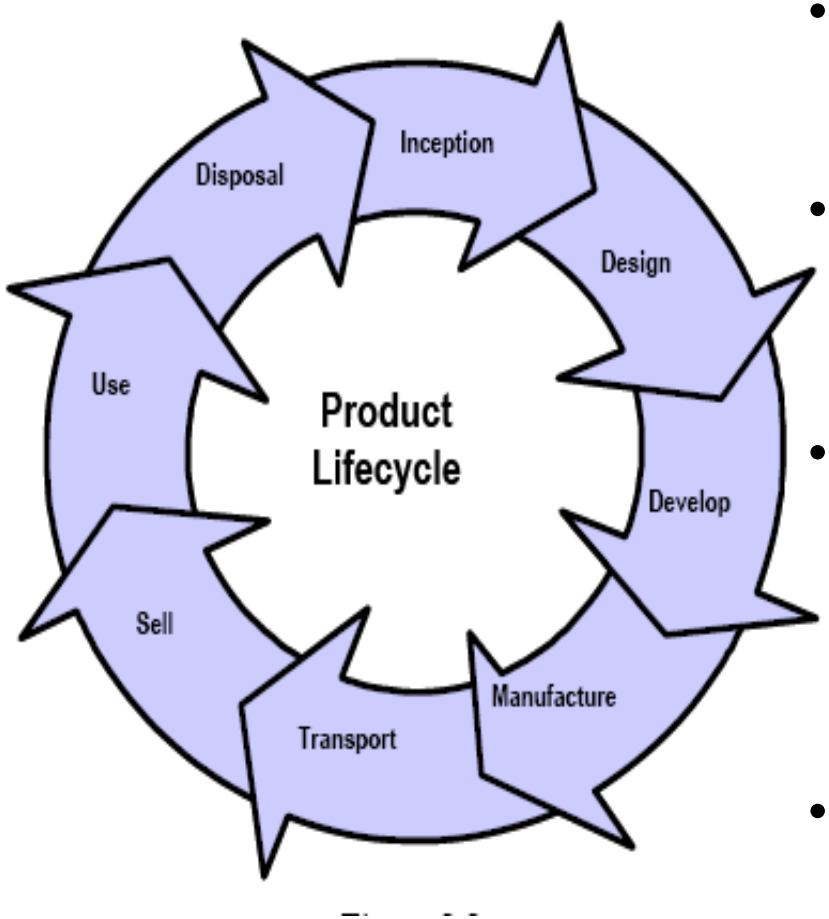
GHS Status (early 2010)



GHS Overview (continued)

- OSHA is expected to publish a final rule on the HazCom Standard, adopting certain GHS aspects, in August of 2011.
- DOT has already adopted aspects of GHS - transport hazard classification criteria for toxic materials and flammable liquids.
- The most noticeable changes brought by the GHS for most U.S. organizations will be the changes to safety labels and safety data sheets
- As an example, the GHS refers to safety data sheets as ~~M~~SDSs. The GHS also standardizes the content and formatting of SDSs

GHS applies to product life cycle



- Set of guidelines for ensuring the safe production, transport, handling, use and disposal of hazardous materials
- Target audiences include workers, consumers, transport workers, agriculture (pesticides) and emergency responders
- Pharmaceuticals, food additives, cosmetics and pesticide residues in food will **not** be covered by the GHS at the point of consumption, but will be covered where workers may be exposed (workplaces), and in transport.
- Similarly, foods are generally not labeled under existing hazard communication systems.

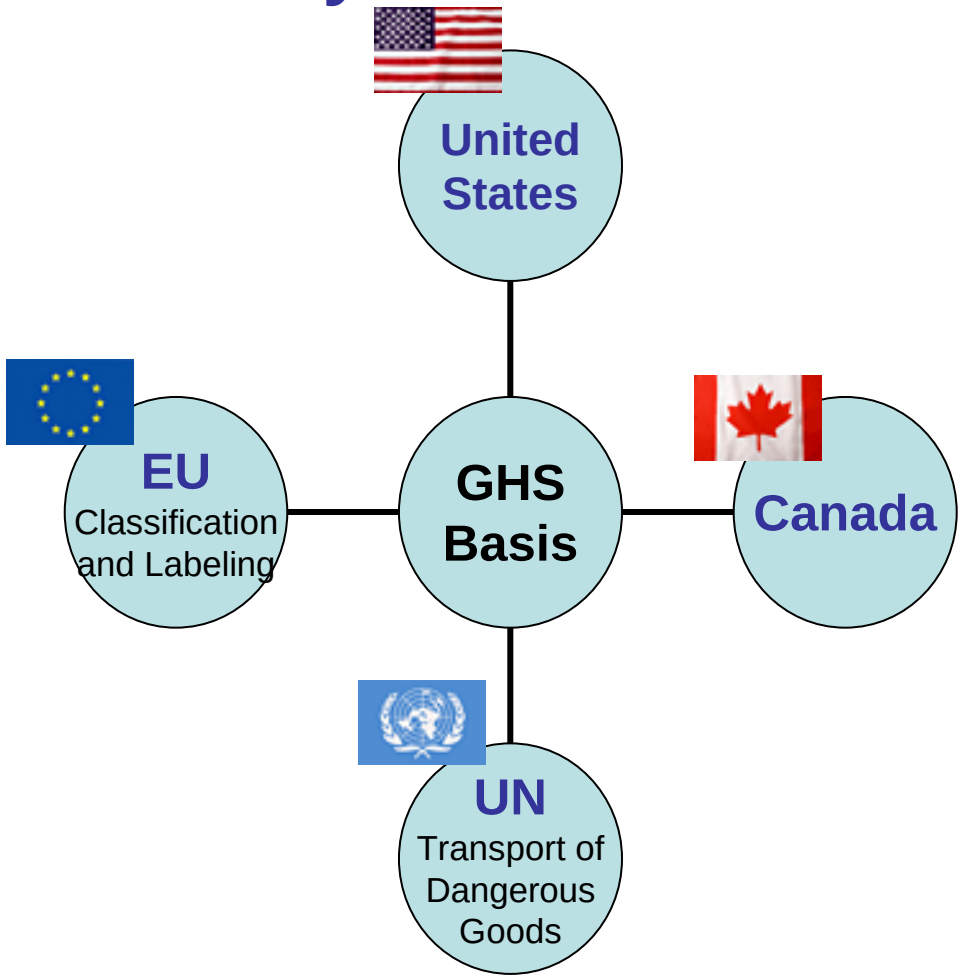
Why is GHS Important?

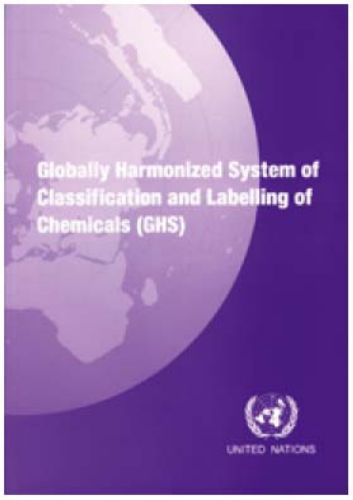
Classification Worldwide

Substance with oral toxicity, LD50 = 257 mg/kg

Regulation	Classification
EU	Harmful (St Andrew's Cross
US (OSHA)	Toxic
Canada (WHMIS)	Toxic (D1B)
Australia	Harmful
India	Non-toxic
Japan	Toxic
Malaysia	Harmful
Thailand	Harmful
New Zealand	Hazardous
China	Not Dangerous
Korea	Toxic
GHS	Danger (Skull & Cross Bones)

Primary basis for GHS

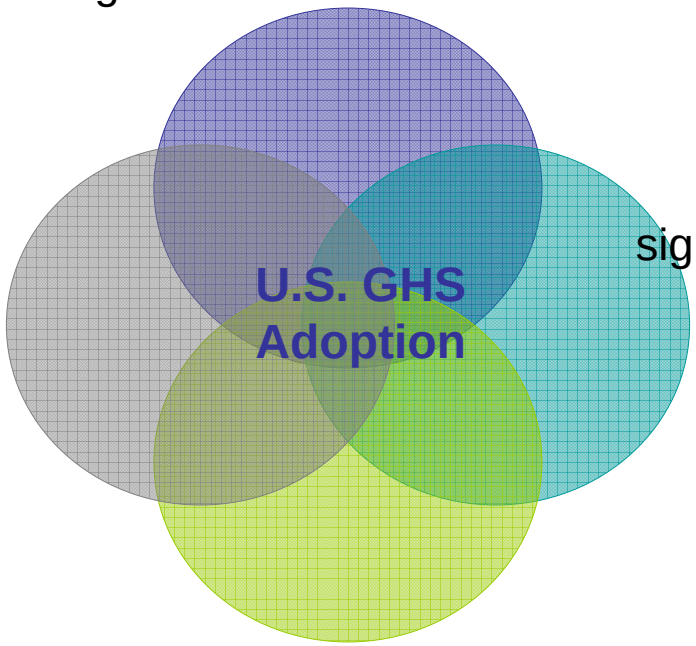




U.S. Interagency Working Group

OSHA served as lead U.S. agency on the classification of chemicals and proposed changes to Hazard Communication Standard

EPA pesticides program



DOT has implemented significant GHS components in its classification of toxic materials and flammable liquids for transportation

CPSC

GHS History

1983-1989	OSHA issues Hazard Communication Standard (HCS), which is expanded to include all industries where employees are exposed to hazardous chemicals.
1990	OSHA issues RFI on HCS international harmonization. Majority of respondents support standard SDSs and labels.
1992-1998	UNCED issues mandate (supported by U.S.) calling for the development of a globally harmonized chemical classification and labeling system by year 2000. OSHA, DOT, CPSC and EPA form Interagency Working Group
2003	UN adopts GHS and first edition of the GHS is published
2006	OSHA publishes Advanced Notices of Proposed Rulemaking (ANPR) on GHS
2007	Second edition of the GHS is published and DOT adopts aspects of GHS - transport hazard classification criteria for toxic materials and flammable liquids.
2009	Third revised edition of GHS is published [currently the most recent] and OSHA proposes modifications to the HCS to conform to GHS
2010	U.S. hosts public hearings on GHS and OSHA's proposed rulemaking.
2010	GHS currently implemented or in various stages of implementation in 67 countries
2011	OSHA announced final rule on GHS to be published – August 2011?

OSHA HCS Regulatory Process

Position

- Revise HCS to align with the GHS
- Maintain HSC framework and enhance workplace protection

Timetable

- ANPR (September 12, 2006)
- Notice of Proposed Rulemaking (September 30, 2009)
- Public hearing and comment period (2010)
- Possible 2011 for published final HCS rule??

Enforcement

- Training on new labels and SDSs within 2 years of final rule
- Full compliance within 3 years of final rule

GHS modifications to U.S. Regulations

- OSHA plans to publish the final rule on the HazCom Standard (HCS) in August of 2011
- HCS *performance oriented* to more GHS *uniformity oriented.* Best Comparison ***http://osha.gov/dsg/hazcom/hcs_side_by_side_draft_100109.pdf***
- Major changes to the HCS will center on:
  - Hazard Evaluation → Hazard Classification
  - Labels
  - MSDSs → Safety Data Sheets
  - Information and Training
- Costs to businesses, according to OSHA, are expected to be limited to a one-time transition that is phased in over a three year period with the greatest costs stemming from:
  - Re-classification of all chemicals
  - Re-authoring of all Safety Data Sheets and Labels
  - Training of workers on new label and SDS elements and familiarization with modified HCS system
- For consumers, labels are expected to be the primary focus of the CPSC

Major Proposed HCS Changes

- **OSHA has more requirements affected by GHS than other agencies.**
  - **Hazard classification:** Provides specific criteria for classification of health and physical hazards, as well as classification of mixtures.
  - **Labels:** Chemical manufacturers and importers will be required to provide a label that includes a harmonized signal word, pictogram, and hazard statement for each hazard class and category. Precautionary statements must also be provided.
  - **Safety Data Sheets:** Will now have a specified 16-section format.
  - **Information and training:** The GHS does not address training. However, the proposed HCS will require that workers are trained within two years of the publication of the final rule to facilitate recognition and understanding of the new labels and safety data sheets.

Hazard Classification

- The world has continued to change as a result of “globalization.”
- We are exporting products to and importing products from countries, which may use hazard classifications that differ from ours.
- These differing classifications could impede trade and the accurate communication of safe practices to employees, customers and the general public.
- For example, a liquid with a flash point of 120º F would have been considered “Flammable” in Germany, but OSHA would consider it “Combustible.”

GHS Basic Hazards

- Physical Hazards
  - Explosives
  - Flammable gases, aerosols, liquids, solids
  - Oxidizing gases, liquids, solids
  - Gases under pressure
  - Self-reactive substances
  - Pyrophoric liquids and solids
  - Self heating substances
  - Water-reactive substances
  - Organic peroxides
  - Corrosives
- Health Hazards
  - Acute Toxicity
    - Immediate toxicity
    - Corrosion to skin/eyes
    - Irritation to skins/eyes
  - Chronic Toxicity
    - Carcinogens
    - Germ cell mutagens
    - Reproductive toxicity
    - Skin/respiratory sensitization
    - Target organ effects
      - Single exposure
      - Repeated exposure
    - Aspiration hazard
- Environmental Hazards
  - Aquatic Hazards
    - Acute
    - Chronic
  - Ozone Hazards

GHS Pictograms

Flame over circle  • Oxidizers	**Flame**  • Flammables • Pyrophorics • Self-Heating • Emits Flammable Gas • Self Reactives • Organic Peroxides	**Exploding bomb**  • Explosives • Self Reactives • Organic Peroxides
Skull and crossbones  • Acute toxicity (severe)	**Corrosion**  • Corrosives	**Gas cylinder**  • Gases under pressure
Health Hazard  • Carcinogen • Mutagenicity • Reproductive Toxicity • Respiratory Sensitizer • Target Organ Toxicity • Aspiration Toxicity	**Environment**  • Aquatic Toxicity	**Exclamation mark**  • Irritant • Skin Sensitizer • Acute Toxicity (harmful) • Narcotic effects • Respiratory Tract Irritation • Hazardous to Ozone Layer

Key Words in GHS

- Class
- Category
- Pictogram
- Signal word
- Hazard Statement

Eye Irritation / Corrosion Label Elements			
	Category 1	Category 2	Category 2B
Symbol			**No symbol**
Signal word	Danger	Warning	Warning
Hazard statement	Causes serious eye damage	Causes serious eye irritation	Causes serious eye irritation

Example: Label Elements

HSC: Labels

- In the past many companies have used NFPA or HMIS type labels for secondary containers.
- New labeling requirements go a bit further requiring the name of the material, GHS signal words, GHS Hazard and Precautionary Statements, and GHS pictograms.
- Many current labeling formats is that a “1” rating means the least hazardous with a “4” rating being the most hazardous.
- GHS is the opposite in that a “1” classification is the most hazardous with a “5” being the least hazardous.

Label Changes

ACETONE
CAS # 67-64-1
DANGER!
EXTREMELY FLAMMABLE LIQUID AND VAPOR. VAPORS MAY CAUSE FLASH FIRE. CAUSES EYE IRRITATION. MAY CAUSE RESPIRATORY TRACT IRRITATION. MAY CAUSE HEADACHE, NAUSEA, DIZZINESS OR OTHER CENTRAL NERVOUS SYSTEM EFFECTS. PROLONGED OR REPEATED SKIN CONTACT MAY DRY SKIN AND CAUSE IRRITATION. Avoid contact with eyes, skin and clothing. Avoid breathing vapors. Keep container tightly closed. Use only with adequate ventilation. Wash thoroughly after handling. Keep out of reach of children.
FIRST AID:
SKIN: In case of contact, immediately flush skin with plenty of water for at least 15 minutes, while removing contaminated clothing and shoes. Get medical attention if irritation persists. Wash clothing before reuse.
EYES: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention immediately.
INHALATION: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.
INGESTION: If swallowed, do not induce vomiting. Obtain medical attention immediately. Never give anything by mouth to an unconscious or convulsing person.
HANDLING AND STORAGE: Keep away from heat, sparks and flame. Ground all equipment during all handling procedures. Store in a cool, dry, well-ventilated area away from incompatibles. Do not store in direct sunlight.
Before using, read Material Safety Data Sheet (MSDS) for this product.
COMPANY NAME
STREET ADDRESS
CITY, STATE / PROVINCE, COUNTRY
ZIP / POSTAL CODE PHONE: ###-###-####

Current ANSI Labeling Standard

Acetone

DANGER
Highly flammable liquid and vapor.
Causes severe eye irritation.
Keep away from heat, sparks and flame – No smoking.
Take precautionary measures against static discharge.
Keep from direct sunlight.
Keep container closed when not in use.
Store in a cool/low temperature, well-ventilated place away from heat and ignition sources.
Use only in a well-ventilated area.
Avoid contact with eyes, skin and clothing.
Wear appropriate personal protective equipment, avoid direct contact.
Flush eyes with water for at least 15 minutes while holding eyelids open.

Company Name
Street Address, City, State/Province, Country
Telephone: (Country Code)-###-####

New GHS label example

HSC: Safety Data Sheets

- Prepare for a influx of new, updated SDSs from manufacturer or distributor to update your facility
- GHS requires specific content in a specific 16 section format (in specified order) similar to ANSI Z400.1
- Section 2 of the SDS will be the Hazards Identification and will have standardized phrases, signal words, and pictograms.
- Section 3 becomes the component section listing the substances using ranges or concentrations under GHS instead of percentages under HCS.
- Under HCS, SDSs are updated when changes are made to material or new hazards are found. GHS, 3-5 years review period

GHS 16-Part SDS Format

1. Identification
2. Hazard(s) identification
3. Composition/ information on ingredients
4. First-aid measures
5. Fire-fighting measures
6. Accidental release measures
7. Handling and storage
8. Exposure control/ personal protection
9. Physical and chemical properties
10. Stability and reactivity
11. Toxicological information
12. Ecological information
13. Disposal considerations
14. Transport information
15. Regulatory information
16. Other information

Tips for Transitioning to GHS

- Stay informed and watch the timetables to know exactly when OSHA publishes the final rule!
- Prepare management for the upcoming change and the needs you will have to insure a successful, compliant transition.
  - Update your current program to reflect the changes in HCS.
  - Employees must be trained on the new content and format of both SDSs and Labels: new classifications, pictograms, signal words.
  - Leverage your chemical data management system to aid in the successful transition of your organization's HAZCOM program.
- Finally—pick a timeframe for your organization's transition and put a plan in place