

Measuring Progress in Chemical Safety: A Guide for Local Emergency Planning Committees and Similar Groups

Introduction

The Emergency Planning and Community Right to Know Act of 1986 (EPCRA) called for the establishment of local emergency planning committees (LEPCs). LEPCs have broad-based membership whose primary work is to receive information from local facilities about chemicals in the community, use that information to develop a comprehensive emergency plan for the community, and respond to public inquiries about local chemical hazards and releases. There are more than 3,000 LEPCs and they reflect the diversity of the country. Most LEPCs are organized to serve a county, some are for a single large city; others cover a larger area of the state.

Many LEPCs have expanded their activities beyond the requirements of EPCRA, encouraging accident prevention and risk reduction, and addressing homeland security in their communities. Composed of representatives from all segments of the community interested in emergency planning and preparedness, LEPCs foster a valuable dialogue among members of the public, industry and government. In some communities LEPCs have formally aligned themselves with FEMA's Citizen Corps Program. These and similar groups can also use this guidance.

There is no doubt that LEPCs have made valuable contributions in chemical safety. This guide provides information about how LEPCs can measure their progress and determine if the actions they are taking continue to achieve the desired outcomes. This approach is based on "Guidance on Developing Safety Performance Indicators related to Chemical Accident Prevention, Preparedness and Response for Public Authorities and Communities" published by the Organization for Economic Development (OECD) in December 2008. There is also a Guidance on Developing Safety Performance Indicators for Industry. The full guidance may be found at www.oecd.org/ehs. An interactive website allows LEPCs to select and customize their review program at <http://oecdsafetyindicators.org/>.

Why Measure Progress?

LEPCs have important roles to play with respect to chemical safety. Setting goals and measuring progress allows you to take a step-by-step approach to reducing the likelihood of accidents and improving preparedness and response capabilities. Depending upon local risks, capacities and conditions, there are several possible goals and metrics that can be applied to the activities of LEPCs. One size does not fit all. The advantage of this

program for LEPCs is the ability to set goals and measure progress in a way that is specifically relevant to the community the LEPC serves.

Your LEPC may be evaluated by local government entities, the mayor, the city council, or a similar group, in order to determine an appropriate level of funding as well as whether the work of the LEPC deserves the time and attention of the membership. Industry may want to know if the chemical information (and often, the financial support) they provide is being used wisely and efficiently. Individual citizens may wonder if your work is effectively protecting them. Federal agencies may use indicators of success to support grant funding and other decisions related to LEPCs. And, of course, you, as LEPC members may want to study what you are doing to see if you are satisfied with your work and whether your efforts have led to better protection of the community from chemical risks. All these and other issues can provide the reason to measure the progress of your LEPC.

How to Measure Progress

Many LEPCs expect a checklist of what they should be doing. However, it is better for LEPCs to have their own vision of success based upon the risks, capacities and conditions in the community they serve. That vision should be written, clear, and come from a group discussion of the concerns and motivations that caused the participants of the LEPC to join.

It may be that none of the LEPC members believe the vision is obtainable given current resources. That does not matter as long as the LEPC understands its mission is to make progress towards the vision. The vision of success is an aspirational goal and should set the long-term objectives for the work done by the LEPC.

Some LEPCs have adopted a vision of success along the lines of:

An engaged community with a broad safety and preparedness culture as show by:

- Robust emergency planning and personal preparation
- Effective and safe response
- Chemical accidents are prevented

Obviously, this or any vision of success cannot be achieved in one or two steps. It is, instead, achieved through a progression of activities designed to achieve milestones along the path to success. To define these steps LEPCs should establish both long-term and short-term goals that it believes will lead to achieving the vision of success. These goals should be a product of clear discussion and agreement among the LEPC membership.

Do not get distracted by terminology. For purposes of the Safety Performance Indicators (SPI) program, goals are often called “outcomes.” The key distinction is that “outputs” are the products that your LEPC makes (e.g., your emergency plan, your evacuation plan) or things that you do (e.g., conduct monthly meetings) but they are not the goals or outcomes that lead to your vision of success. Instead, achieving a goal or outcome

requires measuring the results from outputs or activities in a way that is relevant to the goals or outcomes. For the purposes of SPI these results are called targets or metrics. In other words, when you set a goal it should be paired with what you are going to measure that tells you whether you are making progress towards the goal and when you have achieved the goal.

The following examples might help clarify the outcome/output distinction and the role of targets.

1. If your community has recently had a chemical release that led to injuries and deaths, the mayor or LEPC could establish a goal: no more injuries and deaths from a chemical accident in this community. That is a clear goal, perhaps overly ambitious in the eyes of some people, but one that is understandable and sensible in the context of your community's recent history.
 - a. There are a variety of possible metrics/targets: no deaths or injuries this year, no accidental releases this year, and/or a 30% reduction in the number of accidental releases this year.
 - b. As for "outputs," the products and/or activities that the LEPC undertakes to meet the metric/target for the goal, it could be a revised emergency plan, exercises to test the emergency plan, training for local responders, outreach materials for local citizens to ensure that they know the appropriate steps to take if there is an accidental release, improved notification systems to ensure that citizens are aware of a release, establishing a continuous dialog with industries in your community on risk reduction and accident prevention, and so forth.
 - c. The LEPC then looks at the metrics/targets, including trends and changes over time, to determine if the outputs are productive and useful in achieving the goal.
2. You might have as a goal that local citizens be aware of the chemical hazards present in the community combined with a goal that will involve increased awareness of personal responsibility and appropriate actions in the event of an accident. Your target could be a specific annual increase in the number of people familiar with local chemical hazards. Measuring success could involve some process for interviewing citizens annually or citizen performance in exercises or other tests of emergency plans. "Activities or outputs" to achieve this goal could be public meetings at which chemical hazard information is shared, printed materials with maps showing the location of specific chemicals, video materials for use on television programs and/or at public meetings.
3. Another possible goal is to have all facilities in your community that are subject to EPCRA be in full compliance with the law. Targets could be an annual increase in the number of facilities that have submitted information or a reduction in the number of facilities found to be in noncompliance during inspections. Activities to accomplish these targets, might include an annual

campaign focused on a specific industry sector, or a public campaign urging all facilities to submit the required information.

4. A specific preparedness goal might be for all students and teachers in local schools to be familiar with what actions they should take if there is a chemical release in the community with a possible impact on the school. A possible target could be the number of students/teachers who take the appropriate action during an exercise. As activities the LEPC could conduct training on hazard awareness, shelter in place, develop print and audio/visual materials, and/or prepare signs to post at strategic points.

Why Should You Care?

LEPCs face a terrible burden in demonstrating their worth and the worth of the activities they conduct. LEPCs lack a convincing way to demonstrate this worth because of a tendency to “do things” that seem obviously helpful, for example, hold meetings, make TV announcements describing your LEPC, practice implementing an emergency plan, and share information with the public about the dangers of chemicals in their community. But it is not always clear that these apparently good activities actually contribute to reaching some vision of success. The various audiences served by LEPCs will have their own vision for the success of what LEPCs do and that vision may not be the same as what the LEPC would craft for itself. As these examples and the discussion in Appendix I demonstrates, LEPCs should have a goal oriented reason when they choose their activities, and then be able to demonstrate that those activities helped them make progress in achieving their goals in a measurable fashion.

APPENDIX I

What Are Safety Performance Indicators and How Are They Used?

The OECD guidance uses the term “indicators” to refer to measures that provide insights into a concept (i.e., safety) that is difficult to measure directly. Simply put, the group first identifies some area of concern, then describes the target they want to accomplish in that area. Subsequently, they identify outcome indicators and activities indicators that can help them determine if they are meeting the target they established. (This is probably a bit murky to you. We will provide a detailed example in a bit.)

Outcome indicators help assess whether actions (e.g., policies, procedures) are achieving their desired results. Activities indicators provide you with a means to check regularly whether you are implementing your priority actions in the way you intended. In this way, the activities indicators provide you an opportunity to understand why you are, or are not, achieving your target in a specific area.

As you might be guessing by now, choosing the indicators related to your situation is the key step in this entire process. And the good news is that the OECD guidance, often a bit difficult to understand (it was developed for use in many countries with varying safety customs and practices, with different words to describe their safety practices), is actually very helpful when it comes to choosing performance indicators. In fact, once you have identified an area of concern and an appropriate target, the OECD guidance offers a list of possible outcome indicators and even more activities indicators. You can choose to adopt the OECD language directly, or you can use the OECD list as a way to get you thinking more about the topic with the result that you develop your own indicators. (If you want to use the OECD language, the interactive website mentioned on the first page, <http://oecdsafetyindicators.org/>, will help you lift the OECD language directly into your local evaluation plan.)

Let’s look at an example. Let’s say that your LEPC wants to focus on communication with the public. You should find pages 59-60 in the OECD guidance for Public Authorities and Communities to be helpful. There is suggested “target” language (“The public understands chemical risk information, takes appropriate actions in the event of an accident and has an effective channel to communicate with relevant public authorities.”) Then there are at least eight outcome indicators, for example:

- Extent the public understands and remembers the chemical risk information that has been provided to them by public authorities.
- Extent the public is satisfied with chemical risk information provided to them by public authorities.
- The number and quality of comments provided by the public on the information they have received.

You can see that, if you chose these outcome indicators, you will need to develop a method for gathering data, and then actually gather the data, to know if the outcome indicators are being achieved.

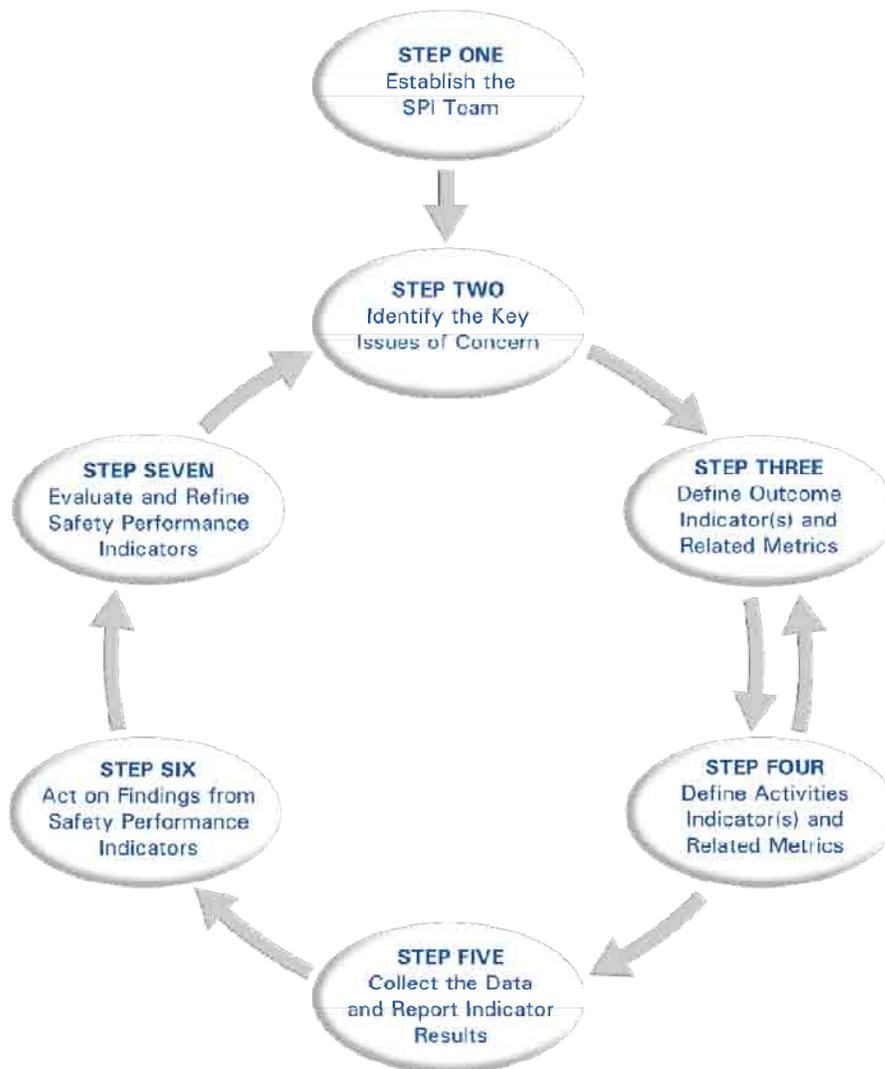
Next, still on page 59, you will find a list of potential activities indicators, for example:

- Is there a specific mechanism to share information between public authorities and the public openly and actively? Has this mechanism been designed in consultation with the public and other stakeholders?
- Is there a mechanism for the public to request information from public authorities and/or industry?

The activities indicators suggest actions and processes that you might want to have in place in order to ensure that the outcome indicators (and the underlying “target”) are reached. The activities indicators can often be answered with a “yes” or “no,” but the real question is: will these activities promote chemical safety? You can see that the options for activities indicators are very wide-ranging. The good news is that, even though the OECD guidance does not provide an exhaustive list of activities indicators, it does provide some very good suggested indicators, which you can start with and adjust to meet your organizations specific needs

The SPI Process

The following figure outlines the SPI process which is described in detail in Chapter 2 of the OECD guidance (beginning on page 9). We shall provide a detailed example in just a bit, but first let us offer some general comments on the process.



The language used in the diagram above is one of many possible ways to describe the SPI process. We are going to use other language in the description of the SPI process and the example scenario that follow to further explain the purpose of each step and to focus on how they can help organize the development of effective safety performance indicators.

Step 1: Gather a team.

Someone must be responsible for conducting the evaluation for your LEPC. The SPI Team could be the LEPC itself, a subcommittee made up of LEPC members, a committee whose members are totally outside the LEPC membership, or some combination of the latter two options. In fact, there is another possibility: you might have a one-person team. You will know if there is someone in your community with special talents for this job. Even if you go with the idea of a committee, that “one-person team” could be the ideal chairman for the committee. Whomever you choose as members, be sure that they are interested in evaluation, have the time to commit (one year, at a minimum), and enjoy the respect of your LEPC and political leaders. You do not want the public to criticize the SPI results on the basis that the team members were not trustworthy.

Step 2: What are the key hazardous materials issues and concerns?

The OECD guidance (page 14) has some good advice for this step. You probably know one or two issues that you would like to analyze. Or your SERC might identify an issue that it would like every LEPC in the state to address. Some very good advice from the OECD guidance: do not fall into the trap of asking what you can measure instead of what you should measure.

Step 3: What does success look like? & Step 4: Identify activities and establish a “yardstick” (outcomes) to show progress.

See the discussion above under “What are safety performance indicators.”

Step 5: Do the activity. Collect the data.

See page 24 of the OECD guidance. Note what they say about using existing data as well as not using too many data points when briefing upper management.

Step 6: Act on the findings.

See page 26 of the OECD guidance. Note that, if there are inconsistencies in the results, it may indicate a problem in your safety program or a problem in the construction of your SPI program. This step involves addressing problems in your safety program.

Step 7: Evaluate and refine the process.

The results in Step 6 should lead you to look at both the safety program and the SPI program. Recall that you need a good list of activities indicators, and it might take time to come up with the right ones. The list in the OECD guidance should be helpful, but

only your experience (plus some advice from your SERC if they are involved in the SPI process) can tell you if you need to revise the activities indicators. If Step 6 leads you to conclude that you have to change your activities indicators, do that and repeat the process as needed. (If you change or revise the activities indicators, you have already gotten to Step 4 for the second time.)

Some Specific Examples

The OECD guidance develops three scenarios (one each for a public agency, the local fire department, and a citizen committee) and shows what the SPI team would do at each step of the process. As an LEPC, you will relate most closely to the citizen committee scenario, but you can also profit from following the other two scenarios through the process. Begin by reading the scenarios on page 11, and then study what actions are taken at each SPI step for each scenario. You may find that one of the scenarios fits your situation; in that case, you might be able to lift a lot of material directly from the OECD guidance.

Let's go through one more example in detail so that you can see how the SPI process could be applied to a school lab cleanup project.

Scenario: Parents of students from the local high school, who are also members of the LEPC, discover storage of chemicals in the school lab while visiting the school during a parent/teacher conference. Upon researching this further, the parents discovered that if these chemicals are not stored and handled properly, they can create a substantial hazard to students and first responders in the event of fire or spill. The parents have approached the school and LEPC to work together to ensure processes are in place for the proper storage and handling of these chemicals and identify a mechanism to evaluate these processes.

The Process of an LEPC / High School Example

Gather a team.

- Representatives of the LEPC, fire department, and other relevant regulatory agencies, if any, along with the school principal and parents meet to scope the project.

What are the key hazardous materials issues and concerns?

- Following discussions among the team members, it was agreed that the "vision of success" was to reduce risk to students and faculty from chemical accidents. Key issues of concern included:
 - Developing appropriate procedures for the safe storage and handling of hazardous chemicals in school,
 - Reducing the risks of a chemical accident by removal of old, unneeded, excess quantities or otherwise hazardous chemicals, and
 - Education of students and faculty on the hazards of chemicals used in the school labs.

What does success look like?

- The team determined that success of this effort would include:
 - Safe removal and disposal of unused, outdated and hazardous chemicals from the school lab.
 - All teachers and students are properly educated regarding the hazards presented and how to handle those chemicals.
 - Programs are implemented to prevent re-accumulation of chemicals, and
 - Procedures are implemented for proper storage and use of hazardous chemicals.

Identify activities and establish a "yardstick" (outcomes) to show progress.

- The metrics would include: quantities of chemicals removed, all teachers and students educated on chemical hazards of school chemicals, institution of inventory control programs as measured by whether old or excess quantities are present term-to-term, and development of proper chemical storage procedures as measured by inspection.

Do the activity. Collect the data.

- The team decided that they would take an inventory of the amount and location of the hazardous chemicals and remove those that were a risk to the students and community. This is to be reported to the school, LEPC, and public via a public meeting and report.
- The team also decided to institute procedures on the safe handling and storage of hazardous chemicals as well as a training program for teachers and students. Procedures are to be reviewed by the science faculty and re-evaluated each term.
- The following data will be collected and reviewed:
 - Number of teachers/students trained on the procedures and competence of the teachers/students based on post-training testing.
 - Number of times procedures are not followed which will be tracked using log book sign in, observations by teachers of students using the chemicals, and number of accidents which occur due to misuse of the chemicals.
 - Number of times inspections showed a failure to follow procedures.

Act on the findings.

- The team agreed that each term, reports would be submitted to the school superintendent, PTA, student body, and LEPC with the results of the tracking of the activity indicators on inventory practices and chemical accidents. These reports would be reviewed by the LEPC/fire department and school administration and faculty to determine if changes need to be made in the procedures and/or the training program.

Evaluate and refine the process.

- At the end of each school year, the team would meet with the LEPC and PTA in order to review the project outcome and the activity indicators to determine if they need to be revised or eliminated and whether new indicators need to be developed and implemented based on the results of the previous year and the experience gained in implementing the SPI program.

Additional examples

LEPCs can submit to EPA any additional examples developed and implemented. These lessons learned will be shared on EPA's website, <http://www.epa.gov/emergencies/>.

Additional information and assistance

The "Guidance on Developing Safety Performance Indicators related to Chemical Accident Prevention, Preparedness and Response for Public Authorities and Communities" was published by the Organization for Economic Development (OECD) in December 2008. The full guidance may be found at www.oecd.org/ehs. LEPCs can use the interactive website at <http://oecdsafetyindicators.org/> to select and customize their review program. Go to the website, click on "Communities," and then click on "My Targets and Indicators." After creating an account, you can log in and create pages appropriate to your scenario.

You can receive additional assistance by using the "Contact Us" function on the interactive website or by contacting EPA through our website <http://www.epa.gov/emergencies/>.