Phase 6 Individual Project

Dissertation Prospectus

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Problem Statement

I would argue that in order to provide leadership during a storm related event, managers should not make their decisions based solely on dogmatic plans that determine what community gets power restored after or during an event. It is founded on the assumption that decisions are made from specific *scripts* well in advance of a loss of electrical power. The problem of deciding who gets power and who doesn't may not be in the interest of some individuals at the time of a loss of power. For example, hospitals and medical centers that cater to the poor may not be ready for a restoration of power because of damage to their internal electrical distribution. Low-income families and individuals may be last on the list for repair. Electric utility managers should develop specific scripts that allow for a flexible restoration of power to community based medical facilities and not based on "power to all" scenarios (Liu, Davidson, & Apanasovich, 2007).

In order to better manage electrical distribution, an in-depth exploration of how electricity is distributed to low-income home owners will build a foundation for understanding why some restorations plans fail. There have been several proposals and schema written to predict electrical power outages and how this information can assist power companies in restoration plans that are effective and fair to low-income households. This research will present the major findings of an evaluation concerning electrical utility manager's preparation and response to outages as they relate to low-income communities. There may be a gap in the literature that proposes an exploration of dogmatic restoration policies not meeting the needs of low-income households.

Significance

This study will fill the gap identified in the problem statement by exploring how managers of electric utility companies can better perform their duties when it comes to restoration of power. Although it may be stated that many decisions on restoration rely on presupposed issues, most power restoration schema relies heavily on grid technical observations and not on whether power should be reestablished on the basis of the public need. Hawkins and Maurer (2012) stated that "In addition to high economic and racial segregation, New Orleans had a tenuous and underserved infrastructure, a poor public transportation system, especially to the poorest neighborhoods, high spatial mismatch (distance between industry and residential sectors), ineffective government, and other structural issues".

This study will examine the processes and policies that electrical utility managers must adhere to in order to restore power after an event. It is assumed that utility companies will bring power to emergency responders first and then to communities. Hospitals, fire stations, police stations and other responders must come initially; it's the selection of "who's next' that my dissertation will address and explore. The implication that low-income homes may be the last to have power restored is a subject of concern. Many low-income households have elderly and special needs residents that may not have had the opportunity to migrate to another care facility due to storm damage and socioeconomic disadvantages.

This research will support the professional practitioners tasked to decide how and when power services are restored. It may answer the "so what" question by bringing to light the needs of storm related survivors. Managers must be able to evaluate power restoration that is not based on economic and social strata. The field of community preparation has become saturated with rehearsal models and many of these prototypes fail to accomplish the vital theme that they

strongly advocate for, currently they are not locally-based and they are not proletarian-determined (Boehm & Cnaan, 2012). The study claim aligns with the problem statement to reflect the potential relevance of this study to assist electrical utility managers and companies through potential findings that lead to a positive management change (Baldick et al., 2009; Cecati, et al.; Kwasinksi, 2010)

Background, Description, and Theoretical Framework

Several issues have been studied when it comes to electrical power disadvantages to low income households. Miles, Gallagher and Huxford (2013) suggested that low-income households are unable to afford back-up generators during the September, 8th 2011 power outage in San Diego. The study also revealed several issues related to restoration policymaking and communication related to life-threatened customers and to the need for a best-practice power restoration plan. For the most part, however, groups' most susceptible to hostile storms-related outcomes (loss of electrical power for example) include some of the following: the elderly; young children; women; those with pre-existing physical and mental health problems, and those living in low-income households (Lane et al., 2013). In addition, Miller, Antonio and Bonanno (2011) suggested that power companies and state officials' in Texas after hurricane Ike had to face severe media and governmental questioning due to slow, uneven electrical recovery.

The description of the framework for this prospectus centers on the problem statement. The theoretical framework will include an exhaustive review of current literature that will include the management of electrical distribution basics, restoration priorities, and low-income communities' reactions to restoring power after a weather related incident. Interviews and surveys (both historical and current) will provide data to substantiate the study. Media interviews may supply third-party data on reactions to power outages. The emphasis will be on how low-

income households before and after a weather related event affect the management of electrical power restoration (Knight, 2013). A theoretical framework informs, forms, and is informed by, the research question(s) and categorizes my research design decisions, which include the method of investigation and data collection and analysis.

Statement of Research Purpose

The purpose of the research is to examine how electrical utility managers and their companies better understand the impact that power restoration policies and planning affect low-income communities. By increasing the knowledge of how restoration of electrical power affects this socioeconomic stratum; managers will be better informed while practicing and planning their efforts in renewing electrical power. Best practices based on several historical scenarios (e.g. Hurricane Katrina and Sandy, flooding and wildfires in Colorado, and Japanese earthquake, tsunami events) will be the main data source, along with interviews and literature investigation (Knight, 2013; Guikema, 2010)

In addition, research in most cases can enhance managerial processes by bringing to light inequalities in "canned" policies and plans. Managers are the directors and implementers of reactive actions when faced with catastrophic events. Plans are established and administered. The issue is not that they are carried out, but do they take into consideration the effects on low-income communities?

Proposed Approach

My proposed approach will be a mixed methodology for a transformative study with the main focus on qualitative methods. A transformative mixed methods research methodology concerns itself with the assumption that knowledge is not neutral but is partial to human benefits

and that all knowledge reflects the authority and communal relationships within societies, and that an important purpose of knowledge construction (and research) is to help advance society. (Creswell, 2014)

This currently, will allow me to explore and examine the effects of established and flexible managerial polices with respect to power outage restoration. The quantitative component of the research will institute a foundation of existing numerical data that deals with electrical distribution, restorations after an event, costs, low-income family statistics, and overall expenditures by electrical distribution companies, both public and private.

Summary of Proposed Methodology

To summarize the mixed methodology for the research, it is important to note that the study is not designed to administer judgment on the positive or negative aspects of power restoration in general, but to understand and contribute to some new and innovative best practice for future events. By interviewing current and post-event mangers and a sound literature review, the study should add to the body of knowledge on how electrical utility managers can best improve their processes. They will be faced with a catastrophic event in the future and this study will allow the managers to achieve a better understanding of their decisions that impact specific socioeconomic communities.

There are many possible types and sources of information or data to study, such as peer-reviewed studies of managerial actions and policymaking that affected the outcomes of emergency weather-related events. Data gathering may include observational media, exploring interviews of managers post events, and historical documents from state and federal archives. Previous observations and reports of electrical restoration and how they affect low-income

families will provide additional interesting data. In addition, there may be the possibility to examine intriguing analytical strategies that include multiple regression, content analysis, and meta-analysis.

References

Baldick, R., Chowdhury, B., Dobson, I., Dong, Z., Gou, B., Hawkins, D., ... & Zhang, X. (2009, March). Vulnerability assessment for cascading failures in electric power systems. In *Power Systems Conference and Exposition, 2009. PSCE'09. IEEE/PES* (pp. 1-9). IEEE.

Boehm, A., & Cnaan, R. A. (2012). Towards a practice-based model for community practice: Linking theory and practice. *Journal of Sociology & Social Welfare,* 39(141).

Cecati, C., Mokryani, G., Piccolo, A., & Siano, P. (2010, November). An overview on the smart grid concept. In IECON 2010-36th Annual Conference on IEEE Industrial Electronics Society (pp. 3322-3327). IEEE.

Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage Publications, Incorporated.

Guikema, S. D., Quiring, S. M., & Seung-Ryong, H. (2010). Prestorm Estimation of Hurricane Damage to Electric Power Distribution Systems. *Risk Analysis: An International Journal, 30*(12), 1744-1752. doi:10.1111/j.1539-6924.2010.01510.x

Hawkins, R. L., & Maurer, K. (2012). "Waiting for the White Man to Fix Things:" Rebuilding Black Poverty in New Orleans. *Journal of Sociology & Social Welfare, 39*(1), 111-139.

Knight, M. (2013, March). Communicating in a Crisis. *Business Communication Quarterly*. pp. 3-4. doi:10.1177/1080569913478583.

Kwasinski, A. (2010). Technology planning for electric power supply in critical events considering a bulk grid, backup power plants, and micro-grids. *Systems Journal, IEEE, 4*(2), 167-178.

Lane, K., Charles-Guzman, K., Wheeler, K., Abid, Z., Graber, N., & Matte, T. (2013). Health Effects of Coastal Storms and Flooding in Urban Areas: A Review and Vulnerability Assessment. *Journal of Environmental and Public Health, 2013*.

Liu, H., Davidson, R. A., & Apanasovich, T. (2007). Statistical forecasting of electric power restoration times in hurricanes and ice storms. *Power Systems, IEEE Transactions on, 22*(4), 2270-2279.

Miles, S. B., Gallagher, H., & Huxford, C. J. (2013). Restoration and Impacts from the September 8, 2011 San Diego Power Outage. *Journal of Infrastructure Systems*.