

# Applying Effective Problem-Solving Methodology to Roof System Evaluations



By Thomas Retych

*This article proposes that an Observation/Interpretation/Application (OIA) model is an effective planning technique to provide solutions to problems encountered during roof system evaluations.*

The application of an effective evaluative methodology can help in both the prediction of problems and in the discovery of solutions. Much more than merely being a proactive plan distinguished by problem awareness (observation), problem assessment (interpretation), and corrective remediation (application), the use of an effective evaluative procedure aids in the development of viable solutions. With widespread applications, the Observation/Interpretation/Application (OIA) problem-solving model is utilized by physicians for patient evaluations, scientists for data diagnostic analysis, and hermeneutical scholars for decoding ancient manuscripts.<sup>1</sup> When used skillfully, this three-step, problem-solving methodology serves as both an invaluable investigative tool and an effective framework to search for systematic solutions. Because of these attributes, the application of this model is useful when applied to roof system evaluations, notably roof inspections and leak investigations.

The OIA method was made popular by Dr. Howard Hendricks, a notable biblical scholar, professor, and past chaplain for the Dallas Cowboys. Although Dr. Hendricks used OIA in relation to bible analysis and study, the methodology is applicable to many facets of life and work, including the roofing industry.

The acronym OIA summarizes the problem-solving sequence:

- **Observation** – accurately recording the problem.
- **Interpretation** – correctly understanding the problem.
- **Application** – effectively determining the validity and impact of the solution.<sup>2</sup>

## OBSERVATION PHASE:

Consider the **Observation Phase** as the foundation of the assessment process. If our observations are flawed or incomplete, the following phases of the OIA method, **Interpretation Phase** and **Application Phase**, will additionally be flawed and incomplete. All three investigative phases must be accurate to arrive at a valid solution. Dr. Hendricks suggested asking questions relating to: what is observed, major and minor issues, visual and concealed causes, and results.<sup>3</sup> This methodology lends itself effectively to roof evaluations.

The questions noted below, when answered with support from a full photo history during the **Observation Phase**, will assist in the development of a complete **Interpretation Phase**.

- **WHAT** is being observed?
- **WHERE** is it occurring?
- **WHEN** is it happening?
- **HOW** is it evident on and below the roof?

Based on memory retention research which suggests that much of what is learned one day is forgotten a day later<sup>4</sup>, the importance of comprehensive photo documentation cannot be overstated and is a requirement for accurate off-site review, interpretation, and reporting. This includes both area overviews and close-up photo records.

<sup>1</sup>T. A. Snider, C Sepoy, & G. R. Holyoak. "Equine endometrial biopsy reviewed: observation, interpretation, and application of histopathologic data," *Theriogenology*, 75, no. 9 (2011), 1567–1581. <https://doi.org/10.1016/j.theriogenology.2010.12.013>.

<sup>2</sup>Tim Newcomb, "Howard Hendrick's 4 Bible Study Steps," *Bible Study Magazine*, September 2016, 9. <https://www.biblestudymagazine.com/bible-study-magazine-blog/2016/7/27/howard-hendricks-4-bible-study-steps>.

<sup>3</sup>Newcomb, "Hendrick's 4 Steps."

<sup>4</sup>"Chapter 9: Memory and Information Processing," Lumen 1300: Effective Learning Strategies, <https://courses.lumenlearning.com/austinctc-learningframeworks/chapter/chapter-9-memory-and-information-processing/>

From both field notes and photo records, a story begins to emerge.

Numerous observations can be recorded from strategically selected overview photos that are not always easily determined from close-ups alone. Roof system design flaws, in addition to specific defects become evident and will guide the investigation through the **Interpretation Phase**.



CLOSE UP PHOTO



OVERVIEW PHOTO

## INTERPRETATION PHASE:

The **Interpretation Phase** is when to make sense of what has been observed and specifically why is it happening. Often, this phase will include research, destructive and non-destructive roof survey processes, applying past experiences and often collaboration with colleagues. It is also during this phase of the process that the roof will often begin to reveal its secrets to the diligent investigator, i.e., defects and design flaws.

Just as critical, if the **Interpretation Phase** of what is observed during the site visit is incomplete or incorrect, the path towards a valid **Application Phase** will be misdirected.

## OCCAM'S RAZOR APPLIED WITHIN OIA EVALUATION METHODOLOGY:

In addition to the OIA evaluation methodology, the investigator may also find the application of another time-tested, problem-solving principle may assist during the OIA "**Interpretation Phase**." Considered a historic model of evaluation dating back to Aristotle and used in the development of scientific theories by individuals such as Albert Einstein, Isaac Newton and more recently Stephen Hawking, this principle is referred to as "Occam's Razor."

Named after William of Ockham (also spelled Occam, from the Latin: Gulielmus Occamus), a 14th century Franciscan friar and logician, this evaluation tool suggests the simplest solution that is consistent with evidence and experience is usually the best choice. Simply stated, the "Razor" represents the cutting away of unnecessary and improbable explanations that are unlikely to be inferred necessarily from the observed phenomenon.<sup>5</sup> The least number of assumptions associated with the interpretation, the better.

A common example of this methodology is displayed when medical interns are instructed, "*If you hear hoofbeats, think horses, not zebras.*"<sup>6</sup> It is of great interest that the same problem-solving philosophy used by some of the most influential minds in recorded history to develop the theory of special relativity or the three laws of motion can be implemented on 21st century rooftops.

Questions to consider during the **Interpretation Phase**:

- **HOW** well does the interpretation fit the observations? What are the exceptions?
- **IS** a "story" emerging from the **Interpretation Phase** that puts it all together?
- **DOES** sufficient evidence exist in the **Observation Phase** and **Interpretation Phase** to warrant moving confidently into the **Application Phase**?
- **WHAT** consequences have been revealed?

It is also valuable during this stage to consider context, all of the factors that exist outside of the roof but that can have a direct impact on your interpretation. Examples of contextual considerations include regulatory requirements for local and state governments, local climate, available capital expenditure budgets, and the building's usage. In a similar decision making model to OIA used by the US Military called OODA (Observe-Orient-Decide-Act)<sup>7</sup>, these contextual questions are the "Orient" stage, where the conditions observed are placed in a larger context which aids decision-making.

<sup>5</sup> "How to Use Occam's Razor Without Getting Cut," Farnam Street (blog), <https://fs.blog/2019/10/occams-razor/>

<sup>6</sup> "Occam's Razor Without Getting Cut."

<sup>7</sup> "The Essence of Winning & Losing," Defense in the National Interest (blog) <https://web.archive.org/web/20110324054439/http://www.danford.net/boyd/essence1.htm>

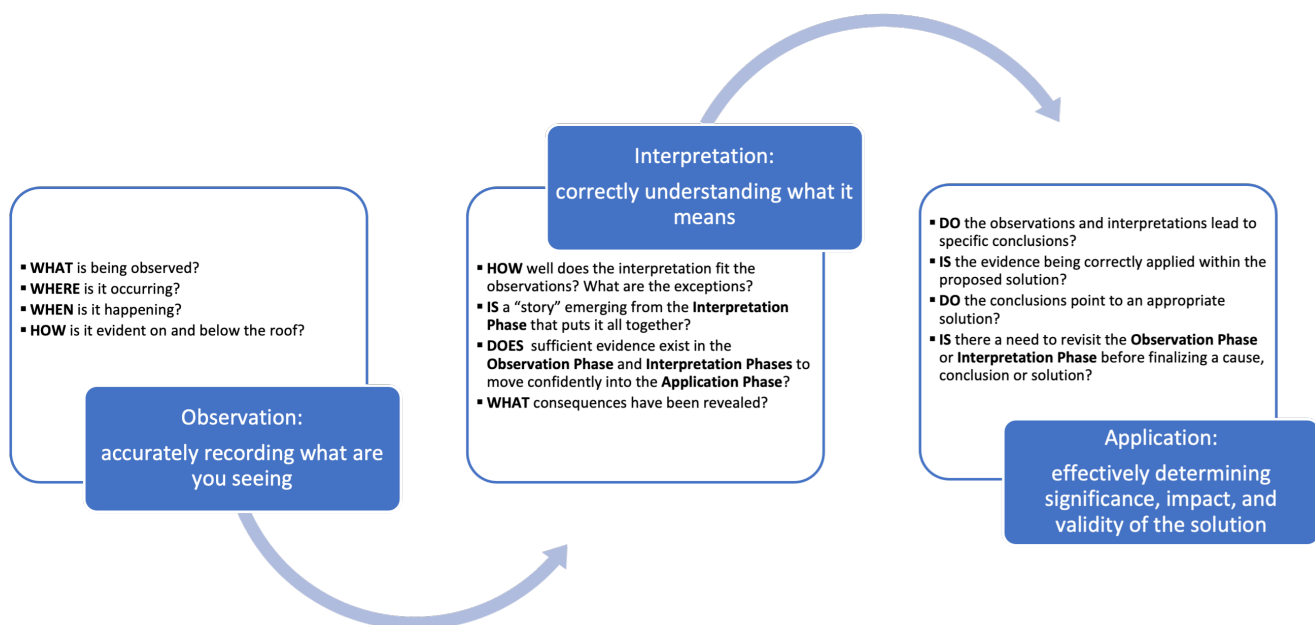
## APPLICATION PHASE:

The goal of the OIA Problem-Solving Methodology is to arrive at the **Application Phase** with confidence that the conclusions and proposed solutions are appropriate and supportable with data and evidence gathered from the previous evaluation phases.

Additional questions to consider during the **Application Phase**:

- **DO** the observations and interpretations lead to specific conclusions?
- **IS** the evidence being correctly applied within the proposed solution?
- **DO** the conclusions point to an appropriate solution?
- **IS** there a need to revisit the **Observation Phase** or **Interpretation Phase** before finalizing a cause, conclusion, or solution?

The following diagram summarizes the OIA Problem-Solving Methodology, as described within this article:



The OIA Evaluation Methodology in combination with the Occam’s Razor principle of managing assumptions are time-tested investigative tools that provide an effective framework to structure many analyses, including roof inspections and leak investigations.

To accurately arrive at a valid conclusion, all pieces of the investigative puzzle must fit together to provide a correct path forward. If the **Application Phase** solution involves a roof repair or replacement, a key piece of the evaluation process is to purposefully performance-match both products, systems, and installer experience to best remedy the specific situation encountered. Proven, premium quality products and systems that have been validated, both through rigorous testing and field application history should be recommended to complete the problem-solving process.



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