# *Diamond Dollars Case Competition*

# **Building a Bullpen**

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*This case was prepared by Vince Gennaro and is developed solely for the purpose of a case discussion. It contains various assumptions that are generated for illustrative purposes and is not intended to serve as a source of primary*

The way in which teams deploy their pitchers has evolved over the last few decades. In 1980, the average starting pitcher lasted 6.3 innings per start. In 2015, the average starting pitcher threw 5.8 inning per start. As a result, the number of reliever innings per game has increased from an average of 2.7 to 3.1, an increase of 17%.

While relievers are garnering a much larger share of the innings pitched than in past eras, another element of the changing deployment is the innings per reliever outing. In 1980, the average relief outing lasted 1.7 innings, compared to an even 1.0 innings pitched per relief stint in 2015, a decline of 41%. There is no question that the role of the bullpen has experienced an overhaul during the last several decades.

Changes in usage have implications for the number of bullpen arms necessary to navigate a season, reliever's frequency of use, the degree to which a manager attempts to optimize a given matchup, and the lefty-righty mix of relievers, are among the considerations that must be taken into account. Bullpen construction is not just about having the best arms, it's about having a portfolio of pitchers who complement each other to create options for the creative manager and pitching coach to deploy them to the team's maximum advantage.

While quality is important, it is often defined by an in-game situation. Take the case of facing the Boston Red Sox's David Ortiz. When looking at the career statistics overall, Jason Hammel of the Cubs is probably "better" than reliever Casey Janssen, formerly of Toronto (more recently with the Nationals). Conversely, against these two right-handers, Ortiz has owned Hammel—9 for 17 over his career, with and .882 slugging percentage and a 1.461 OPS vs. the Cubs righty. However, against reliever Casey Janssen, Ortiz is 1 for 16 with a .125 slugging percentage and a *.292 OPS*. Furthermore, looking at two lefty pitchers who are similar in quality to each other, at this stage of their careers—Matt Moore and Brian Matusz—the statistics show another interesting story. Ortiz crushes Moore to the tune of 10 for 24 with 3 HRs, 8 walks, and a slugging percentage of .917 and an OPS of 1.378. Conversely, against Matusz, Ortiz is 4 for 29 with 13 strikeouts and a .241 slugging percentage and a meek .408 OPS.

The bottom line, quality is not an "absolute", as it can also be influenced by the situation—in the above examples it's player matchups. In these cases, the season total numbers do not eall an entirely objective story of a particular situation. Another important element of determining the ideal composition of a bullpen is the various roles of relievers. Some accomplished relievers are reluctant to pitch the 9th inning in a save situation. As one successful veteran reliever said to me, the lack of a "safety net" made him uncomfortable with the closer role and inhibited him from performing up to his true talent level. Conversely, players such as Jonathan Papelbon seem to covet the role of "leading man" among his team's relief pitchers and are reluctant to be relegated to an alternative role in any bullpen, regardless of the incumbent closer.

Beyond the issues of overall quality of bullpen arms and the respective roles of relievers, the issues of organizational philosophy, principles, and strategy for relief pitching come into play. For example: How much of a premium does an organization place on swing and miss capabilities? While teams prefer pitchers who deprive hitters of putting balls-in-play, how much of a walk-rate will an organization tolerate to get those extra strikeouts? Is there a trade-off between strikeouts and groundball rate? Should a team accept lower K-rates from relievers if a player has a high groundball rate, which can be doubleplay inducing? Is there a ballpark

component to your bullpen construction? Do teams in spacious parks like Safeco in Seattle or AT&T Park in San Francisco have greater tolerance for four-seam fastball pitchers who may throw higher in the strike zone and yield more flyballs, which presumably are less likely to leave their ballpark as HRs?

This case challenge is about constructing a bullpen that optimizes the collective performance of a team's relief pitching. These are questions that every MLB team wrestles with each offseason, as well as during the season. The only piece of this exercise that does not mirror an MLB team's efforts is that you will be able to hit the "reset" button and start from a clean sheet. You will have plenty of rules and constraints, but not an existing roster of relievers with which to blend your acquisitions and limit your open slots. The goal of this case is to understand how you think through roster construction, while encouraging you to think of it holistically. Here are the rules for your case:

1. You will have 5 relief spots to fill on a 12-person pitching staff. Five of the 12 pitching slots consist of: a 5-man starting rotation; a long-man/spot starter; and a middle-reliever who will be called up from your minor league system to fill the 25th spot on your team's roster. You should assume this last call-up is a reliever who will see limited action in mop-up roles or when a relief pitcher is pressed into service in the 5th inning due to a short outing by a starting pitcher. You are not being asked to name this reliever. Your task is to choose the other 5 relief pitchers.

2. Your 5 relief pitching selections will follow a set of rules and constraints laid out below:
   a. You may pick only *one* of the following four relievers:
      i. Delin Betances
      ii. Craig Kimbrel
      iii. Kenley Jansen
      iv. Andrew Miller

   b. You may pick only *one* of the following four relievers:
      i. Zach Britton
      ii. Ken Giles
      iii. Mark Melancon
      iv. Tony Watson

   c. You may pick *two* of the following twelve relievers:
      i. Cody Allen
      ii. Jeurys Familia
      iii. Luke Gregerson
      iv. Kelvin Herrera
      v. Darren O'Day
      vi. David Robertson
      vii. Sergio Romo
      viii. Trevor Rosenthal
      ix. Drew Storen
      x. Carson Smith
      xi. Josh Fields
      xii. Liam Hendriks

d. Your 5th selection is an *at-large selection* that cannot include any of the names on the above lists, nor can it include any pitcher who had less than 50 relief innings in MLB in 2015. **Your selection also cannot include Aroldis Chapman or Wade Davis**, both of which are ineligible for selection in this case.

3. In order to provide additional context for your selections, you will select a 2016 team, for which your bullpen selections will replace their existing bullpen. The purpose of selecting a team is to allow you to consider your choices in the context of your ballpark, the team's 2016 opponents, your expected 2016 starting rotation, and the quality of your defense, should you choose to include those factors in evaluating your choices. You are permitted to select any *National League* team. Please select just one NL team for your entire exercise. Also assume your bullpen is being assembled for the 2016 season only. Do not consider whether or not the pitcher will be more or less effective over the next 2 or 3 years. This is strictly a one-year, 2016 exercise. Finally, *do not consider the player's salary as a factor in any of your choices*.

## The Case Problem
To summarize, your assignment is to develop the most effective bullpen for a given NL team, given the constraints imposed above, including rules on which relief pitchers and combination of relievers can be selected.

Your output for this case assignment should be in the form of a powerpoint presentation to support a 20-minute oral presentation to a panel of judges. The presentation should include:

- **Your process**—the methodology used in your evaluation of a trade, including:
  - Your overall philosophy and strategy for assembling a bullpen
  - The criteria you used to evaluate, differentiate, and select relief pitchers
  - The reasons for selecting (or not selecting) certain pitchers
  - Identify any unique characteristics of the NL team you chose, or the ballparks in which they will play, their unbalanced schedule in 2016, and how these aspects influenced your selections

- **Performance forecasts for your chosen relievers**—while you will not have time to go into detail, you should reveal your performance expectations for each of the pitchers you chose, perhaps contrasting them to pitchers you did not choose.

- **An assessment of the risk of your bullpen choices**—any good decision process acknowledges the risks associated with the ultimate decisions. But in order to provide context, your projection requires some measure of the uncertainty associated with your forecast. Please share your approach to assessing and rating the riskiness of your selections, including any portfolio thinking.

- Any remaining calculations, thought processes, or considerations you employed to justify your answers to the above questions that are important in assembling your team's bullpen.

The 20-minute oral case presentation will be followed by a 10-minute Q & A by the judges.

The judge's criteria will focus on the quality of your *decision process*, more than any single "right" answer. The ideal decision process has a logical flow, and is inclusive of the key factors that are expected to have a true impact on the decision. More specifically, there are several key areas that will be a focus for the judges:

- Your overall methodology and process for selecting the group of relief pitchers and your method for quantifying the value of a reliever
- The reasonableness, defensibility, and depth of information and data used in player performance evaluations and projections included in your presentation
- Your overall level of creativity, particularly in your assessment of the risk factor associated with your selections
- The quality and clarity of the presentation of your analysis and recommendations


A final comment regarding "rules" of the case and the competition:
- The intent of the competition is that team members are competing against other team members. This means that assistance from professors or non-members of the team is not permitted. Also, do not contact any MLB team or league personnel for advice on any of the case issues.
- You are encouraged to use the internet to help you with the case, particularly as a source of data, but be prepared to add your own insights, including quantitative analysis to the material you choose to draw from on the internet.
- One of the most common pitfalls for Case Competition participants is the over-reliance on analysis published on the leading analytical websites. While it is often valuable to consider these analyses, student teams have lost points by relying solely on these sites for answers to key case questions. We are looking to understand *your* analyses of the case questions.

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